

JVC

SERVICE MANUAL

TIME LAPSE VIDEO CASSETTE RECORDER

[Revised Edition]

BR-9060E



SPECIFICATIONS

GENERAL

Recording system	Luminance—FM Chroma—Down-converted
Signal system	PAL/CCIR, 625 lines
Tape speed	23.39 mm/s (VHS SP) 11.70 mm/s (VHS LP)
Record/Play time	3, 6, 24, 72, 120, 240, 480 and 960 hours (with E-180 video cassette)
Operating temperature	5°C to 40°C
Operating humidity	35 % to 80 %
Storage temperature	-20°C to 60°C
Power requirement	220-240 V AC, 50/60 Hz
Power consumption	30 watts
Dimensions	435(W) x 124(H) x 370(D) mm

VIDEO

Input	0.5 to 2.0 Vp-p, 75 ohms, unbalanced, BNC
Output	1.0 Vp-p, 75 ohms, unbalanced, BNC
Horizontal resolution	Colour—240 lines (VHS SP) B/W—300 lines (VHS SP)
S/N ratio	More than 43 dB (VHS SP)

AUDIO

Number of tracks	1
Input	-8 dBs, RCA
Output	-6 dBs, RCA

TIME/DATE GENERATOR

Display	Day, month, year, hours, minutes, seconds, Recording mode
Character size	16H
Power backup	Approx. one year

ALARM

Alarm input	Ground input
Alarm output	Alarm input through-out
Camera switching output	Negative pulse output (approx. 5 ms), BNC

SERIES RECORDING

Series input	Ground input, RCA
Series output	Series input through-out, RCA
Accessories	"R6" batteries x 5 Remote control unit x 1 Switch cover x 1 Lock key x 2

TABLE OF CONTENTS

Section	Title	Page	Section	Title	Page
Important Safety Precautions					
INSTRUCTIONS					
1. DISASSEMBLY					
1.1	REMOVING OF EXTERNAL COVERS	1-1	4.19	TIME LAPSE SERVO CIRCUIT BOARD	4-22
1.2	REMOVING OF MAIN BOARDS	1-2	4.20	TIME LAPSE SERVO SCHEMATIC DIAGRAM (1/2)	4-23
1.3	REMOVING OF A/V BOARD	1-3		TIME LAPSE SERVO SCHEMATIC DIAGRAM (2/2)	4-24
1.4	REFERENCE	1-3	4.21	MECHAON SCHEMATIC DIAGRAM (1/2)	4-25
1.5	USAGE OF EXTENSION BOARD	1-4		MECHAON SCHEMATIC DIAGRAM (2/2)	4-26
1.5.1	Connection of extension board PGJ05037	1-4	4.22	MECHAON CIRCUIT BOARD	4-27
1.5.2	Connection of extension board PGJ05038	1-4	4.23	VIDEO SUB SCHEMATIC DIAGRAM & CIRCUIT BOARD	4-28
1.6	REMOVAL OF MAIN DECK	1-5	4.24	REAR SCHEMATIC DIAGRAM & CIRCUIT BOARD	4-29
2. MECHANISM ADJUSTMENT					
2.1	GENERAL	2-1	4.25	VIDEO PRE/REC SCHEMATIC DIAGRAM (1/2)	4-30
2.1.1	Precautions	2-1	4.26	VIDEO PRE/REC SCHEMATIC DIAGRAM (2/2)	4-31
2.1.2	Required test equipment, fixtures and tools	2-1	4.27	ON SCREEN DATA/BATTERY SCHEMATIC DIAGRAM	4-32
2.1.3	Layout of main parts	2-2	4.28	ON SCREEN DATA/BATTERY CIRCUIT BOARD	4-33
2.1.4	Main parts replacement table	2-4	4.29	DISPLAY SCHEMATIC DIAGRAM	4-34
2.2	MAIN ASSEMBLY REPLACEMENT	2-5	4.30	DISPLAY CIRCUIT BOARD	4-35
2.3	ASSEMBLY PROCEDURE OF MECHANISM	2-8	4.31	CLEANER SCHEMATIC DIAGRAM	4-36
2.4	CONFIRMATION AND ADJUSTMENT	2-10	4.32	CLEANER CIRCUIT BOARD	4-37
2.5	TAPE TRANSPORT CHECKS AND ADJUSTMENT		4.33	TIMER SCHEMATIC DIAGRAM	4-38
	PREPARATIONS	2-11	4.34	TIMER CIRCUIT BOARD	4-39
2.6	INTERCHANGEABILITY CHECKS AND		4.35	OPERATION SCHEMATIC DIAGRAM	4-40
	ADJUSTMENTS	2-12	4.36	OPERATION CIRCUIT BOARD	4-41
3. ELECTRICAL ADJUSTMENTS					
3.1	PREPARATION	3-1	4.37	DECK TERMINAL CIRCUIT BOARD	4-42
3.1.1	Required test equipment	3-1	4.38	DECK TERMINAL SCHEMATIC DIAGRAMS	4-43
3.1.2	Check and adjustment steps	3-1	4.39	IC BLOCK DIAGRAMS	4-44
3.1.3	Required test signal	3-1			
3.1.4	Alignment tape specifications	3-2			
3.1.5	Factory switches setting	3-2			
3.2	REQUIRED TEST INSTRUMENTS AND FIXTURES	3-3			
3.3	SWITCHING REGULATOR CIRCUIT	3-3			
3.4	SERVO CIRCUIT	3-4			
3.5	AUDIO CIRCUIT	3-9			
3.6	VIDEO CIRCUIT	3-10			
3.7	PRE/REC CIRCUIT	3-17			
3.8	TDG/TIMER CIRCUIT	3-18			
3.9	CLEANER CIRCUIT	3-19			
4. DIAGRAMS AND CIRCUIT BOARDS					
4.1	KEY TO ABBREVIATIONS	4-2			
4.2	CIRCUIT BOARD LOCATIONS	4-3			
4.3	OVERALL WIRING DIAGRAM (1/2)	4-4			
	OVERALL WIRING DIAGRAM (2/2)	4-5			
4.4	POWER SYSTEM	4-6			
4.5	MAIN (VIDEO) BLOCK DIAGRAMS	4-7			
4.6	SERVO BLOCK DIAGRAM (1/2)	4-8			
	SERVO BLOCK DIAGRAM (2/2)	4-9			
4.7	MAIN (AUDIO) BLOCK DIAGRAM	4-10			
4.8	MECHAON BLOCK DIAGRAM	4-10			
4.9	VIDEO PRE/REC BLOCK DIAGRAM	4-11			
4.10	POWER SUPPLY SCHEMATIC DIAGRAM	4-12			
4.11	POWER TRANS CIRCUIT BOARD	4-13			
4.12	MAIN (VIDEO) SCHEMATIC DIAGRAM	4-14			
4.13	MAIN (AUDIO) SCHEMATIC DIAGRAM	4-16			
4.14	MAIN CIRCUIT BOARD	4-17			
4.15	D/C SERVO SCHEMATIC DIAGRAM	4-18			
4.16	D/C SERVO CIRCUIT BOARD	4-19			
4.17	TIME LAPSE SUB SERVO SCHEMATIC DIAGRAM	4-20			
4.18	TIME LAPSE SUB SERVO CIRCUIT BOARD	4-21			
5. EXPLODED VIEWS AND PARTS LIST					
5.1	STANDARD PART NUMBER CODING	5-2			
5.1.1	Screw coding	5-2			
5.1.2	Fuse coding	5-3			
5.2	EXPLODED VIEWS AND PARTS LIST	5-3			
5.2.1	Packing assembly	5-3			
5.2.2	Cabinet assembly	5-4			
5.2.3	Chassis assembly	5-5			
5.2.4	Mechanism (1) assembly	5-1			
5.2.5	Mechanism (2) assembly	5-6			
6. ELECTRICAL PARTS LIST					
6.1	STANDARD PART NUMBER CODING	6-2			
6.1.1	Fixed resistor coding	6-2			
6.1.2	Fixed capacitor coding	6-3			
6.1.3	Fuse coding	6-5			
	POWER SUPPLY BOARD ASSY <01> <02>	6-6			
	MAIN BOARD ASSY <04>	6-7			
	D/C SERVO BOARD ASSY <05>	6-14			
	TIME LAPS SERVO BOARD ASSY <06>	6-15			
	MECHAON BOARD ASSY <07>	6-16			
	TIME LAPS SUB SERVO BOARD (1) ASSY <08>	6-18			
	TIME LAPS SUB SERVO BOARD (2) ASSY <09>	6-19			
	VIDEO SUB BOARD ASSY <10>	6-19			
	AC HEAD BOARD <12>	6-20			
	UPPER DRUM BOARD <41>	6-20			
	PRE/REC BOARD ASSY <43>	6-20			
	DECK TERMINAL BOARD ASSY <51>	6-22			
	RELAY BOARD ASSY <52>	6-22			
	REC SAFETY BOARD ASSY <53>	6-22			
	END SENSOR BOARD ASSY <54>	6-22			
	CASSETTE HOUSING BOARD ASSY <56>	6-22			
	ON SCREEN DATA/BATTERY BOARD (1) ASSY	6-22			
	ON SCREEN DATA/BATTERY BOARD (2) ASSY	6-23			
	REAR BOARD ASSY <76>	6-23			
	DISPLAY BOARD ASSY <77>	6-23			
	CLEANER BOARD ASSY <78>	6-24			
	TIMER BOARD ASSY <79>	6-24			
	OPERATION 1 BOARD ASSY <92>	6-25			
	OPERATION 2 BOARD ASSY <93>	6-26			

Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

● Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the  symbol and shaded (■) parts are critical for safety.

Replace only with specified part numbers.

Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Fuse replacement caution notice.

Caution for continued protection against fire hazard.
Replace only with same type and rated fuse(s) as specified.

4. Use specified internal wiring. Note especially:

- 1) Wires covered with PVC tubing
- 2) Double insulated wires
- 3) High voltage leads

5. Use specified insulating materials for hazardous live parts. Note especially:

1) Insulation Tape	3) Spacers	5) Barrier
2) PVC tubing	4) Insulation sheets for transistors	

6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

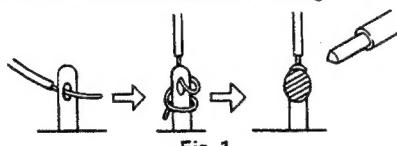


Fig. 1

7. Observe that wires do not contact heat producing parts (heat-sinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10–15 kg of force in any direction will not loosen it.

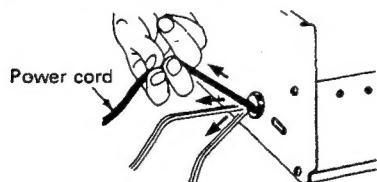


Fig. 2

10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)

In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector

In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.

1) Connector part number : E03830-001

2) Required tool : Connector crimping tool of the proper type which will not damage insulated parts.

3) Replacement procedure

(1) Remove the old connector by cutting the wires at a point close to the connector.

Important : Do not reuse a connector (discard it).

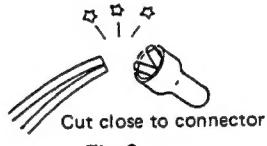
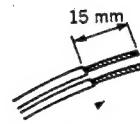


Fig. 3

(2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.



15 mm

Fig. 4

(3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

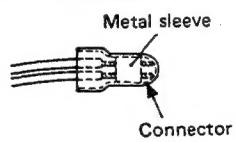


Fig. 5

(4) As shown in Fig. 6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

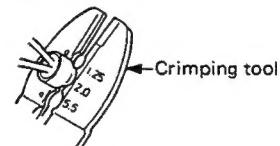


Fig. 6

(5) Check the four points noted in Fig. 7.

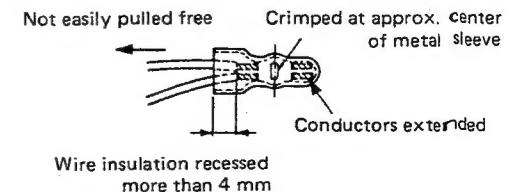


Fig. 7

● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions. Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. Insulation resistance test

Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

2. Dielectric strength test

Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

3. Clearance distance

When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table 1 below.

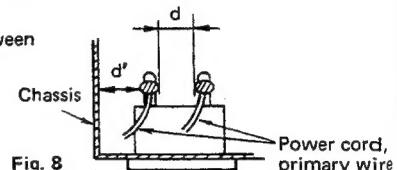


Fig. 8

4. Leakage current test

Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).

Measuring Method: (Power ON)

Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

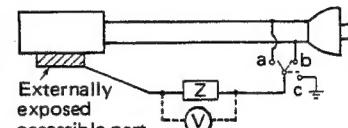


Fig. 9

5. Grounding (Class I model only)

Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).

Measuring Method:

Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.

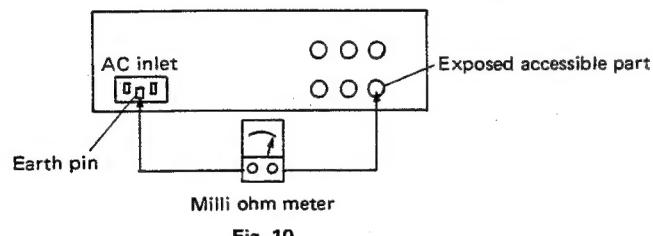


Fig. 10

Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	$Z \leq 0.1 \text{ ohm}$
Europe & Australia	$Z \leq 0.5 \text{ ohm}$

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	$R \geq 1 \text{ M}\Omega / 500 \text{ V DC}$	AC 1 kV 1 minute	$d, d' \geq 3 \text{ mm}$
100 to 240 V			AC 1.5 kV 1 minute	$d, d' \geq 4 \text{ mm}$
110 to 130 V	USA & Canada	—	AC 900 V 1 minute	$d, d' \geq 3.2 \text{ mm}$
110 to 130 V 200 to 240 V	Europe & Australia	$R \geq 10 \text{ M}\Omega / 500 \text{ V DC}$	AC 3 kV 1 minute (Class II)	$d \geq 4 \text{ mm}$
200 to 240 V			AC 1.5 kV 1 minute (Class I)	$d' \geq 8 \text{ mm} \text{ (Power cord)}$ $d' \geq 6 \text{ mm} \text{ (Primary wire)}$

Table 1 Specifications for each region

AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan	$0 - \text{---} - 0$ $1 \text{ k}\Omega$	$i \leq 1 \text{ mA rms}$	Exposed accessible parts
110 to 130 V	USA & Canada	$0.15 \mu\text{F} - \text{---} - 0$ $1.5 \text{ k}\Omega$	$i \leq 0.5 \text{ mA rms}$	Exposed accessible parts
110 to 130 V 220 to 240 V	Europe & Australia	$0 - \text{---} - 0$ $2 \text{ k}\Omega$	$i \leq 0.7 \text{ mA peak}$ $i \leq 2 \text{ mA dc}$	Antenna earth terminals
		$0 - \text{---} - 0$ $50 \text{ k}\Omega$	$i \leq 0.7 \text{ mA peak}$ $i \leq 2 \text{ mA dc}$	Other terminals

Table 2 Leakage current specifications for each region

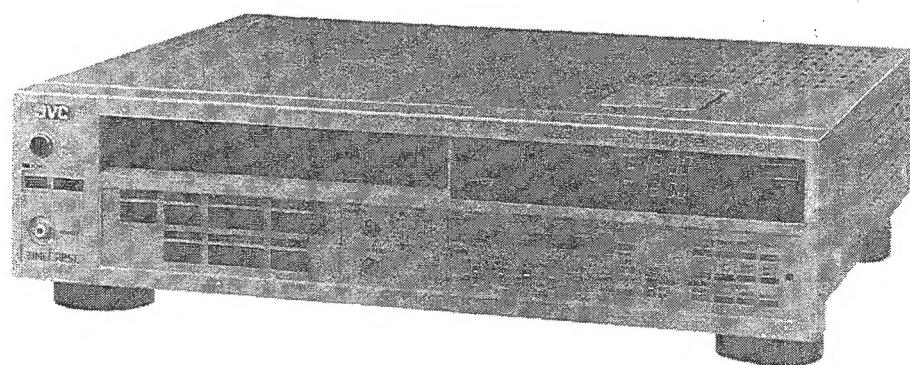
Note: These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

INSTRUCTIONS

JVC

BR-9060E

TIME LAPSE VIDEO CASSETTE RECORDER



POWER SYSTEM

Connection to the mains supply

This set operates on 220 to 240V~, 50/60 Hz.

This unit is produced to comply with Directives 76/889/EEC, 82/499/EEC and 87/308/EEC.

IMPORTANT (in the United Kingdom) Mains Supply (AC 240 V~) WARNING — THIS APPARATUS MUST BE EARTHED

The wires in this mains lead are coloured in accordance with the following code:
GREEN and YELLOW: EARTH
BLUE: NEUTRAL
BROWN: LIVE
As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows. The wire which is coloured GREEN-AND-YELLOW must be connected to the terminal in the plug which is marked with the letter E or by the safety earth symbol $\frac{1}{2}$ or coloured GREEN or GREEN-AND-YELLOW. The wire which is coloured BLUE must be connected to the terminal which is marked with the letter N or which is coloured BLACK. The wire which is coloured BROWN must be connected to the terminal which is marked with the letter L or coloured RED.

PRECAUTIONS

Warning Notice FOR YOUR SAFETY (Australia)

- Insert this plug only into effectively earthed three-pin power outlet.
- If any doubt exists regarding the earthing, consult a qualified electrician.
- Extension cord, if used, must be three-core correctly wired.

Moisture condensation

- If you pour a cold liquid into a glass, water vapor in the air will condense on the surface of the glass. This is called moisture condensation.
- Moisture condensation on the head drum, one of the most crucial parts of the video recorder, will cause damage to the tape.
- Moisture in the air will condense on the recorder when you move it from a cold place to a warm place, or under extremely humid conditions.

CAUTION

To prevent electric shock, do not open the cabinet. No user serviceable parts inside. Refer servicing to qualified service personnel.

Note: The rating plate and the safety caution are on the rear of the unit.

Handling and storage

- Avoid using the recorder under the following conditions:
 - extremely hot, cold or humid places.
 - dusty places.
 - near appliances generating strong magnetic fields.
 - places subject to vibrations, and
 - poorly ventilated places.
- Be careful of moisture condensation.
- Avoid using the recorder immediately after moving from a cold place to a warm place. The water vapor in warm air will condense on the still-cold video head and tape guides and may cause damage to the tape and the recorder.
- Handle the recorder carefully.
- Do not block the ventilation openings.
- Do not place anything heavy on the recorder.
- Do not place anything which might spill and cause trouble on the top cover of the recorder.
- Use in horizontal (flat) position only.
- In case of transportation.
 - Avoid violent shocks to the recorder during packing and transportation.
 - Before packing, be sure to remove the cassette from the recorder.

Video cassettes

- Video cassettes are equipped with a safety tab to prevent accidental erasure. When the tab is removed, recording cannot be performed.

CONTENTS

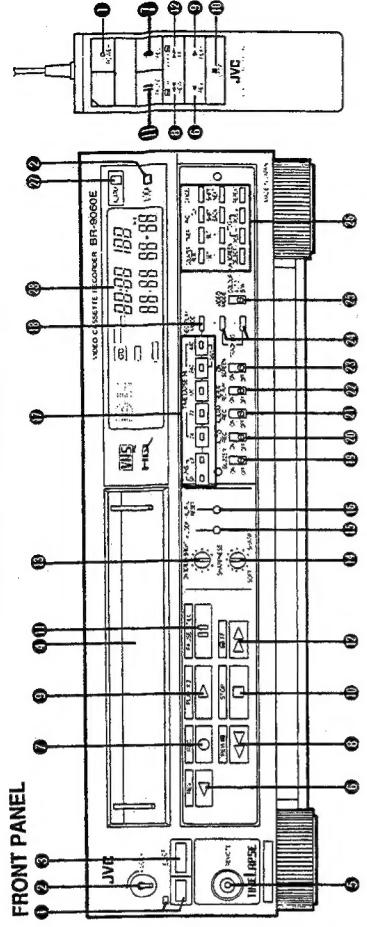
Precautions	2
Features	3
Controls and Connectors	4
Connections	7
Loading and Unloading a Video Cassette	9
Recording	9
Playback	10
Special-Effects Playback	10
Next-Function Memory	11
Specifications	18

AVAILABLE RECORDING OPTIONS ACCORDING TO THE SETTING OF THE REC MODE BUTTON

REC MODE switch setting	E-30	E-60	E-90	E-120	E-180	Recording time	Recording interval	Audio recording	Playback interval
VHS/SP	30 min	1 hour	1 h 30 min	2 hours	3 hours	—	—	—	—
VHS/LP	1 hour	2 hours	3 hours	4 hours	6 hours	—	—	Yes	—
TL/24	4 h 30 min	9 hours	12 hours	18 hours	24 hours	0.16 sec	—	—	0.32 sec
TL/72	12 hours	24 hours	36 hours	54 hours	72 hours	0.48 sec	—	—	0.96 sec
TL/120	20 hours	40 hours	60 hours	90 hours	120 hours	0.8 sec	—	—	1.6 sec
TL/240	40 hours	80 hours	120 hours	180 hours	240 hours	1.6 sec	—	—	3.2 sec
TL/480	80 hours	160 hours	240 hours	360 hours	480 hours	3.2 sec	—	—	6.4 sec
TL/960	160 hours	320 hours	480 hours	720 hours	960 hours	6.4 sec	—	—	12.8 sec

FEATURES

CONTROLS AND CONNECTORS



RECORDING FUNCTIONS

① **MAXIMUM RECORDING TIME OF 960* HOURS**
In the time-lapse mode, recording times of 24, 72, 120, 240, 480 and 960 hours can be selected with an E-180 cassette. Recording times of 3 hours and 6 hours are possible in the SP (Standard Play) and LP (Long Play) modes. This choice allows a recording time suitable for any purpose to be selected, whether you're out for a few minutes or several days at a time.

* Factory set to 480-hour mode.

② **SHUTTLE SEARCH**

High-speed search in the forward and reverse directions is possible at 9x normal speed for recordings made in the SP, LP and time-lapse modes. 2x-1x search is also possible for all recordings.

③ **STILL FRAME ADVANCE AND TL MODE PLAYBACK**

These playback functions allow you to check any scene slowly and carefully.

④ **ALARM SEARCH FUNCTION**

A VISS (VHS Index Search System) code is recorded on the control track at the start of alarm recordings; these can be retrieved at high-speed even in the FF/REW mode to review any suspicious activities that triggered an alarm. Thanks to this function, the customers can trace the point of alarm recordings using the consumer model VHS deck which has a VISS capability at his home.

⑤ **SAFETY FUNCTIONS**

① **POWER FAILURE AUTO RESET**
If there is a power failure during recording, when the power is restored, recording restarts in the same mode as before the power outage, automatically.

② **NEWLY DEVELOPED HEAD CLEANING MECHANISM**

For perfect picture, the heads are cleaned every time the tape is loaded and unloaded and at regular intervals in time-lapse mode.

③ **REPEAT FUNCTION**

When the tape has been fully recorded, it is rewound and recording restarts from the beginning, to ensure that nothing is missed. A similar function makes playback more convenient.

④ **KEY LOCK FUNCTION**

By operating the lock key, the function buttons are disabled and mistakes in operation are prevented. The green LED on the front panel will light in key lock mode.

⑤ **5000-HOUR HOUR METER**

This helps schedule maintenance.

⑥ **TIME/DATE BACKUP**

Even if there is a power failure, the time and date are backed up for about 1 year and do not need to be reset.

⑦ **TAPE-END BUZZER (Three minutes)**

When the tape is about to finish, this warns the operator.

⑧ **ALARM/POWER LOSS MEMORY**

The last alarm and power loss start time (YEAR/MONTH/DAY) will be memorized and indicated in the on-screen display.

⑨ **VIDEO MODE SELECTION**

The BR-9060 incorporates a Colour/Auto/B & W video mode select switch. The horizontal resolution is more than 300 lines (B/W mode).

⑩ **WIRED REMOTE CONTROL CAPABILITY**

⑪ **SERIES RECORDING IN/OUT CONNECTORS**

PLAYBACK FUNCTIONS

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⑪ **SERIES RECORDING IN/OUT CONNECTORS**

CONTROLS AND CONNECTORS

② **SHUTTLE SEARCH**

High-speed search in the forward and reverse directions is possible at 9x normal speed for recordings made in the SP, LP and time-lapse modes. 2x-1x search is also possible for all recordings.

③ **STILL FRAME ADVANCE AND TL MODE PLAYBACK**

These playback functions allow you to check any scene slowly and carefully.

④ **ALARM SEARCH FUNCTION**

A VISS (VHS Index Search System) code is recorded on the control track at the start of alarm recordings; these can be retrieved at high-speed even in the FF/REW mode to review any suspicious activities that triggered an alarm. Thanks to this function, the customers can trace the point of alarm recordings using the consumer model VHS deck which has a VISS capability at his home.

⑤ **SAFETY FUNCTIONS**

① **POWER FAILURE AUTO RESET**
If there is a power failure during recording, when the power is restored, recording restarts in the same mode as before the power outage, automatically.

② **NEWLY DEVELOPED HEAD CLEANING MECHANISM**

For perfect picture, the heads are cleaned every time the tape is loaded and unloaded and at regular intervals in time-lapse mode.

③ **REPEAT FUNCTION**

When the tape has been fully recorded, it is rewound and recording restarts from the beginning, to ensure that nothing is missed. A similar function makes playback more convenient.

④ **KEY LOCK FUNCTION**

By operating the lock key, the function buttons are disabled and mistakes in operation are prevented. The green LED on the front panel will light in key lock mode.

⑤ **5000-HOUR HOUR METER**

This helps schedule maintenance.

⑥ **TIME/DATE BACKUP**

Even if there is a power failure, the time and date are backed up for about 1 year and do not need to be reset.

⑦ **TAPE-END BUZZER (Three minutes)**

When the tape is about to finish, this warns the operator.

⑧ **ALARM/POWER LOSS MEMORY**

The last alarm and power loss start time (YEAR/MONTH/DAY) will be memorized and indicated in the on-screen display.

⑨ **VIDEO MODE SELECTION**

The BR-9060 incorporates a Colour/Auto/B & W video mode select switch. The horizontal resolution is more than 300 lines (B/W mode).

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① REC mode indicators

These indicate the recording time and playback time (when using an E-180 cassette), selected with the REC/PLAY MODE button ⑩.

SP mode

LP mode

24H mode

72H mode

120H mode

Time Lapse modes

(Note: The on-screen indication for the 960H mode is 480H.)

240H mode

480H mode

240: 7680H mode)

480: 960H mode)

their effect. Tracking is reset to normal when both buttons are pressed together, a cassette is ejected, or the power plug is disconnected.

② VIDEO MODE select switch

Select one of the three positions according to the input signal during recording or the output signal during playback.

COLOUR: Set to this position when the input or playback video signals is a colour signal.

AUTO: The circuit is automatically switched between colour and black/white, allowing optimum recording and playback. When this position is used with black/white signals, a higher picture resolution can be obtained. Normally set this switch to this position.

Set to this position when the input or playback signal is a monochrome signal. Higher picture resolution will be obtained.

③ TIMER/TDG buttons

• COUNTER RESET button: Press to reset the counter on the FDP to "00:00".

• TIMER button: Press to engage the TIMER standby mode after you have preset the time for unattended recording.

• PROGRAM/CLOCK button: Press to change the display to the timer set mode.

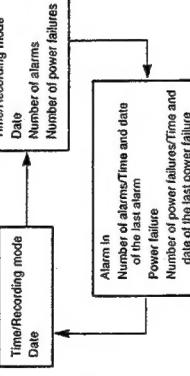
• CANCEL button: Press this button at any time during timer programming to clear the program, or use to engage the cancel program mode.

• SET (+/-) button: Press these to adjust the displayed data when setting the clock and programming the timer.

• SHIFT (NEXT/BACK) buttons: Press these to change displayed figure when setting the clock and programming the timer.

④ ON SCREEN SELECT button

Selects the on-screen display mode between the following three.



⑤ TDG Position V/H buttons

Use to shift the position of the superimposed time and date characters in the vertical and horizontal directions. (See page 16.)

⑥ REPEAT REC/PLAY switch

ON: When the end of the tape is reached in recording, the tape is rewound and recording restarts automatically from the start. When the end of the tape is reached in playback, the tape is rewound and playback restarts automatically.

OFF: No repeat operation.

⑦ ON SCREEN ON/OFF switch

ON: Time/date information is recorded together with the input signal and is superimposed on the monitor screen.

OFF: No information is recorded or superimposed.

⑧ TRACKING (+/-) buttons

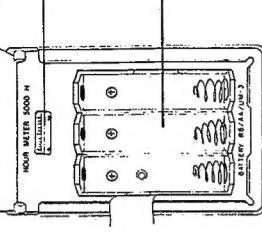
If noise bars can be seen during playback, double-speed playback and slow search, use these buttons to minimize

TOP PANEL

⑨ HOUR METER (5,000 hours)

⑩ Battery Holder

For the batteries backing up the time/date generator. Note: The batteries must be replaced once a year.



⑪ Fluorescent display panel (FDP)

Switchable display

* Clock

* Timer start time

* Cassette loaded indicator

* Alarm search, status display

* Tape counter

* Timer stop time

* Date

* Cancel program

* Timer programming aids

* Switchable display

* Tape counter

* Timer stop time

* Date

* Cancel program

* Timer programming aids

* Switchable display

* Tape counter

* Timer stop time

* Date

* Cancel program

* Timer programming aids

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* Date

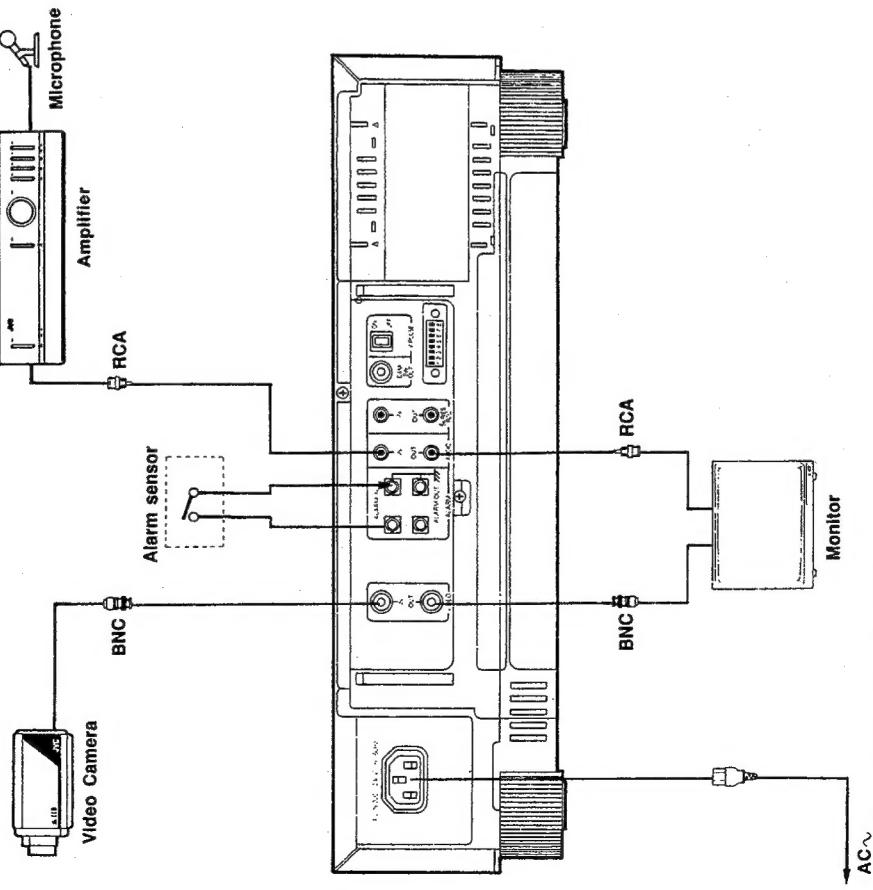
* Cancel program

* Timer programming aids

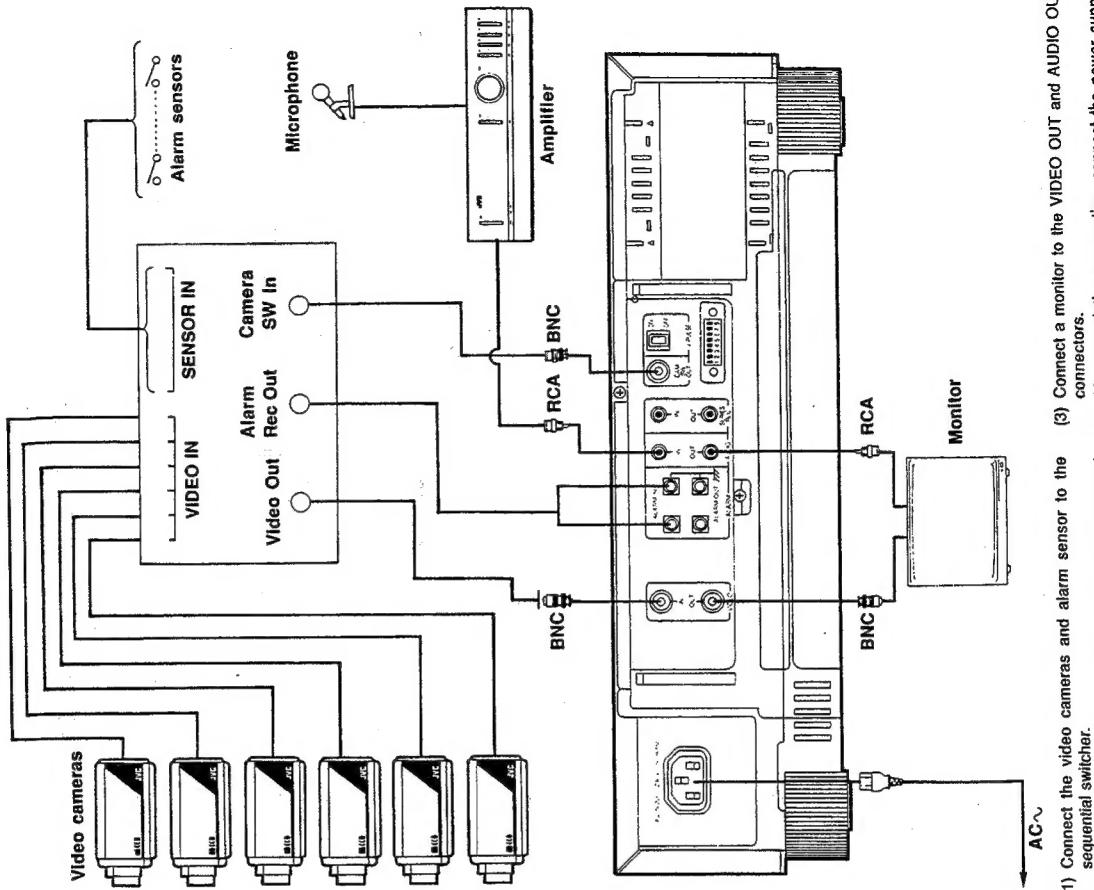
* Switchable display

CONNECTIONS

I Connection to a camera with a built-in SSG



II Connection to several cameras using a sequential switcher



- 1) Connect the rear panel VIDEO OUT and AUDIO OUT connectors to a monitor.
- 2) Connect the video output of the camera to the VIDEO IN connector.
- 3) If an audio input is required, connect a microphone to the AUDIO IN connector.
- 4) If an alarm sensor is to be used, connect across the ALARM INPUT terminal and GND.
- 5) After completing connection, connect the power supply cord.

- 1) Connect the video cameras and alarm sensor to the sequential switcher.
- 2) Connect switcher's video output, alarm signal output and camera switching signal input to the corresponding terminals of the recorder.
- 3) Connect a monitor to the VIDEO OUT and AUDIO OUT connectors.
- 4) After completing connection, connect the power supply cord.

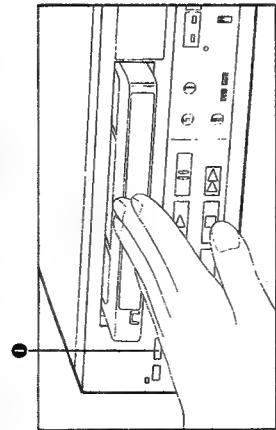
LOADING AND UNLOADING A VIDEO CASSETTE

PLAYBACK

Loading
Insert a cassette as illustrated with its labelled side facing you.

- With a cassette inserted, the "cassette inserted" mark appears on the display panel.

Unloading
Press the EJECT button ①. The cassette will be ejected.



Caution

- If unloading of a cassette is not possible, check to see whether the TIMER indicator is lit. If so, press the TIMER button so the TIMER indicator extinguishes.
- Do not attempt to pull out the cassette once automatic loading has started.
- The automatic loading mechanism will operate only when the cassette is inserted correctly.

WARNING

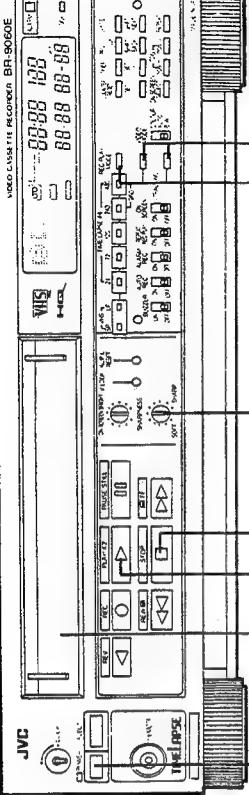
- Do not insert fingers or any foreign object beyond the door flap of the cassette loading slot, as this could lead to injury or damage to the mechanism. Show special caution with children.

The cassette can be unloaded even when the power has been turned off. If a cassette is inside, pressing the EJECT button turns the power on automatically and, after ejection of the cassette, shuts it off automatically.

- Inserting a cassette, with its safety tab removed, turns the recorder on and playback of the cassette begins automatically.

Notes:

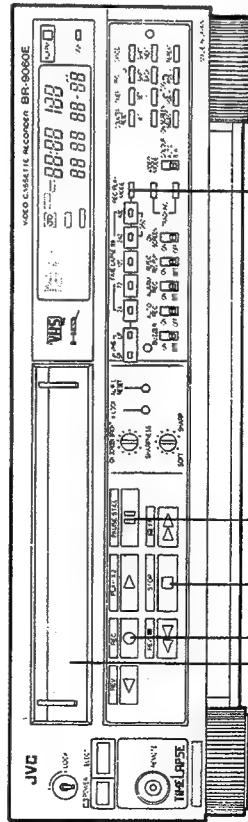
- Be sure to insert the cassette firmly into the slot; otherwise, it will be automatically rejected.
- The automatic loading mechanism will operate only when the cassette loaded has no safety tab, playback starts automatically.



- Press the POWER button on.
- Set the REC/PLAY MODE button as required.
- Insert a pre-recorded cassette into the cassette loading slot.
- When the cassette loaded has no safety tab, playback starts automatically.
- Press the PLAY/X2 button.
- Press the FF or REW button.
- Adjust the picture as required with the SHARPNESS control.
- Press the STOP button to stop playback.

Motorized loading system
The cassette can be loaded even when the power has not been turned on. Inserting a cassette into the loading slot turns the power on automatically.

RECORDING



- Insert a video cassette into the cassette loading slot.
- Set the REC/PLAY MODE button as required.
- Press the REC button to ON. The record mode will be engaged and the REC indicator on the FDP will light.
- Press the STOP button to stop recording.
- Press the PAUSE/STILL button ⑤ to stop recording temporarily.
- Press the PLAY/X2 button to restart recording.
- Note: If left in the Pause mode for more than about 5-1/2 minutes, the VTR will enter the Stop mode.

- While in the Pause mode, a Record-Pause bar appears at the bottom of the screen and indicates the elapsed time up to 5 minutes 25 seconds by reducing its size.

ALARM SEARCH

Note:
You can follow the speeded-up picture on the monitor screen.

- If the FF or REW button is pressed in the Stop mode, the tape stops at the start of an alarm recording.

SHUTTLE SEARCH

Note:
When the REW or FF button is pressed in the Stop mode, normal rewind or fast forward takes place. When these buttons are pressed in the Play, or Still mode, the tape runs at about 9 times normal speed in the corresponding direction. The buttons can be locked and the indicator lights.

Note:
You can follow the speeded-up picture on the monitor screen.

- For briefer scanning, keep the REW or FF button pressed for more than 2 seconds; when you release the button, the Search mode will be cancelled.

STILL & FRAME ADVANCE

- Press the PAUSE/STILL button in the Play mode, the tape will stop and a still picture will be obtained.
- To advance the still picture, press again.
- To return to the normal Play mode, press the PLAY/X2 button.

CLOCK ADJUSTMENT

REVERSE PLAYBACK

- Press the REV button in the PLAY mode; the tape will be played back in reverse at normal speed.

DOUBLE-SPEED PLAYBACK

- Press the PLAY/X2 button in the Play mode; double-speed playback will be engaged.
- To resume normal playback, press the same button again.

NEXT-FUNCTION MEMORY

Memory Play function

- If you want to watch the tape from its beginning after rewinding, press the REW button and then PLAY within 2 seconds. Playback will start automatically at the beginning of the tape.
- While the tape is being rewound, the PLAY indicator is blinking. To cancel the Memory Play mode and go to another mode, press the corresponding button (STOP, PLAY, FF, REW, EJECT, Power OFF).

- To engage the Timer Standby mode after rewind, press REW and then TIMER within 2 seconds. (To cancel the Memory Timer Standby mode, press TIMER or Power.)

Memory Eject/Power-Off/Timer Standby

- If you are going to eject the cassette, turn the power off or engage the Timer Standby mode after rewinding the tape, you don't have to wait for completion of rewind to press the corresponding button.
- To eject the cassette after rewind, press REW and then EJECT within 2 seconds. (To cancel the Memory Eject mode, press STOP, PLAY, FF or REW.)
- To turn the power off after rewind, press REW and then POWER within 2 seconds. (To cancel the Memory Power-off mode, press POWER.)

- To engage the Timer Standby mode after rewind, press REW and then TIMER within 2 seconds. (To cancel the Memory Timer Standby mode, press TIMER or Power.)

Plug the recorder into an AC outlet. "SU" and "0:00" will flash on the FDP.

- If left for longer than one minute, this mode is cancelled.

1. Press the PRG/CLK button ① to enter the clock adjust mode.

2. Press the SET(+/-) button ② to enter the hours.

- If one digit is to be input, press "SHIFT NEXT", then the digit.

3. Press the SET(+/-) button ② to enter the minutes.
4. Press the "SHIFT NEXT" button, then the day will flash.

5. Press the SET (+/-) button ② to enter the day.

6. Press the "SHIFT NEXT" button, then the month will flash.

7. Press the SET (+/-) button to enter the year (last two digits).

8. Timekeeping will start when the PRG/CLK button is pressed.

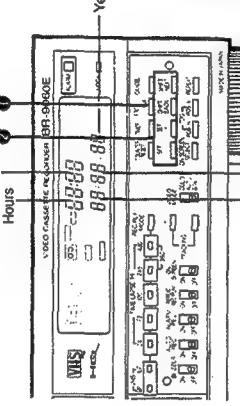
Notes:

- The correct day of the week will be displayed automatically.
- If you want to alter the setting of only one entry, the flashing digits can be changed by pressing the "NEXT" and "BACK" buttons.
- The seconds will be reset to "00" by pressing the SHIFT (NEXT/BACK) or SET (+/-) button in the Clock Adjust mode.
- When re-adjusting the time, pressing the PRG/CLK button repeatedly changes the display mode in the following sequence:

- Timer mode → Clock Adjustment mode → Clock mode →

Power failure indicator

The entire clock display may be reset to SU 0:00 and start to flash. This is not a malfunctioning of the clock, but it indicates that the batteries are discharged. Re-adjusting the time with replaced batteries restores the normal condition of the clock display.



PROGRAM TIMER SETTING

To program the timer, the clock must have been set correctly.

1. Turn on the power and press the PRG/CLK button ① to set to the Program Timer Set mode.

- Program number "1" will blink.
- To advance to programs 2 to 8, press the "SET +/-" button the required number of times. After program 8 the display will return to the clock mode.

2. Verify the program to be set by pressing the SHIFT NEXT button.

- "SU" will blink.

3. Then set the desired data by selecting the item to be set (day, starting time, and stop time) with SET (+/-) buttons ② and verify the data for each time with the SHIFT (NEXT/BACK) buttons ③.

- The data is also displayed on the monitor screen.
- To see the on-screen data, supply a composite video signal to the video input connector.
- To cancel the program, press the CANCEL button ④.
- To repeat this program weekly, press the REPEAT button ⑤.

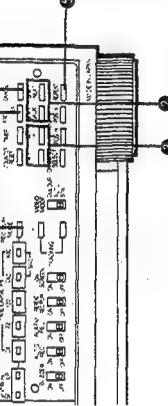
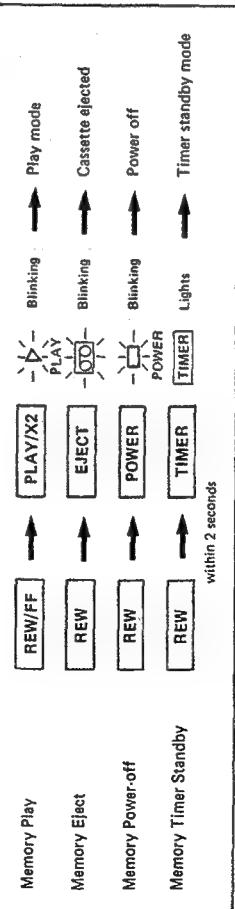
4. To select the recording mode, set the REC/PLAY MODE select button ⑥ on the front panel.

5. After one program has been set, to move to the next program, press the SHIFT NEXT button ⑦.

6. When data has been set, press the PRG/CLK button again.

Notes:

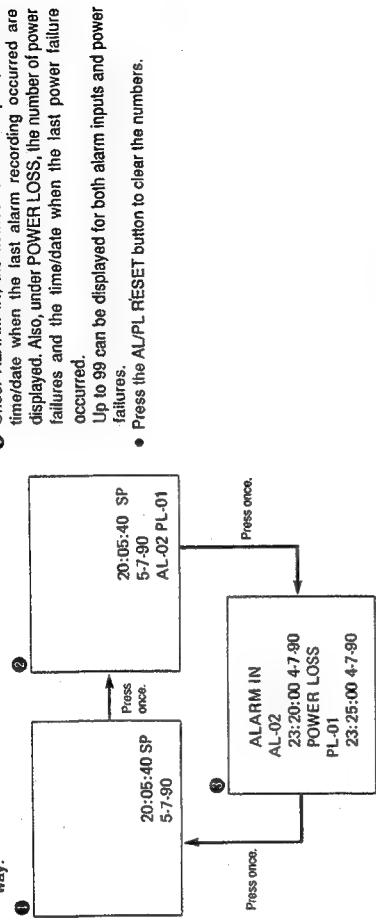
- The lens place will also change accordingly when the units place is advanced or reversed by pressing the SET (+/-) button.
- When the SHIFT NEXT button is pressed after the starting time has been set, the same time is displayed for the stop time.



ON-SCREEN DISPLAY

Variety of day setting possibilities		Setting	Setting method	Indication FDP
No.				
1	One day of the 1st week (week after week)		SET (+ REPEAT)	$\frac{\text{SET}}{\text{S1}} \text{ week}$ - - - - -
2	One day of the 2nd week (week after week)		SET (+ REPEAT)	$\frac{\text{SET}}{\text{S2}} \text{ week}$ - - - - -
3	Daily recording from Sunday through Saturday (week after week)		SET (+ REPEAT)	$\frac{\text{SET}}{\text{S1-S6}} \text{ week}$ - - - - -
4	Daily recording from Monday through Saturday (week after week)		SET (+ REPEAT)	$\frac{\text{SET}}{\text{M1-S6}} \text{ week}$ - - - - -
5	Daily recording from Monday through Friday (week after week)		SET (+ REPEAT)	$\frac{\text{SET}}{\text{M1-F5}} \text{ week}$ - - - - -

1. Normal display mode
Each time the front panel **ON SCREEN SELECT** button is
pressed, the display mode changes.



- REPEAL indicator is available by pressing the REPEAL button at any time in the setting procedure.
- As in SEC 1 (+) button is pressed, the indication progresses in sequence from No. 1 to No. 5 of the above settings and then returns to No. 1.

Timer Indication

- When the TIMER button is pressed with a cassette loaded and the timer correctly programmed, the TIMER indicator on the display will light with the corresponding preset program number(s) also lighting and the power is turned off.
- When you have preset several programs at a time, confirm that all the preset program numbers light together with the TIMER indicator when the TIMER button is pressed. The program whose number does not light has not been correctly preset. Recheck the programmed data. If two or more programs have overlapping times, the OVER LAP indicator on the FLP will blink rapidly after the TIMER button has been pressed. If no change is made in the programmed data, later programs will begin only after earlier programs are completed.
- If all programs have been wrongly preset, the TIMER indicator will blink for about 10 seconds when the TIMER button is pressed, and then the timer Standby mode will be cancelled.
- If the TIMER button is pressed when a cassette is not loaded, the TIMER indicator will continue blinking.
- If the safety tab has been removed or loaded, the tape loaded and TIMER indicators will blink and the cassette will be ejected.
- As long as the TIMER button is engaged with the TIMER indicator lit, unloading of a cassette is not possible.
- When the TIMER button is pressed before all programming items have not yet been set, the program number blinks and turns off after 10 seconds. Recheck the programmed data.

Timer operation

- Tape loading starts 20 seconds before the preset start time and the recording start signal is triggered 2 seconds before the preset time so that recording starts exactly at the preset time.
- During timer recording, the number of the program that is presently operating will be blinking.
- If the end of the tape is reached during timer recording, the Auto Rewind mode is engaged and, after rewind to the tape beginning, recording will re-start if the REPEAT REC/PLAY switch is set to ON. (If the REPEAT REC/PLAY switch is set to OFF, the cassette will be ejected.) If the preset time elapses during rewind, the power is switched off.
- When the tape is ejected at the tape end during timer recording, replace the cassette and press the REC button; timer recording will continue.
- If a power failure should occur, not only time-keeping stops, but also all the preset data will be cancelled. (A blinking SU 0:00 indicates this after power has been reapplied.) In such case, first correct the time indication and then re-enter the programming data.

Checking the programmed data

- To do this, press the recorder's PRG/CLK button while in the Timer Standby mode. The FPD will show programmed data for 5 seconds for each program number by automatically switching. You can also check each program by advancing program numbers manually with the SET + button. (If left for more than 60 seconds, this display will be cancelled.) If recording is required, disengage the Timer Standby mode and use the regular recording method.

Checking the programmed data

- To do this, press the recorder's PRG/CLK button while in the Timer Standby mode. The FDP will show program data for 5 seconds for each program by automatical switching. You can also check each program by advancing program numbers manually with the SET+ button. (If left for more than 60 seconds, this will be cancelled). If re-programming is required, disengage the Timer Standby mode and use the regular re-programming method.

- Time/Date generator data to be recorded (hours, minutes, seconds, recording mode, day, month, year)

- ② Number of alarm inputs and power failures, in addition to ①.
- ③ Under ALARM IN, the number of alarm inputs, and the time/date when the last alarm recording occurred are displayed. Also, under POWER LOSS, the number of power

Up to 99 can be displayed for both alarm inputs and power failures and the time/date when the last power failure occurred.

- Press the AL/PL RESET button to clear the numbers, failures.

Procedure:

- ① Press the CANCEL button **①** for longer than 5 seconds and then press the PRG/CLK button **②** within 5 seconds. Then the following on-screen display will appear with day digits blinking.

Note: February 29 can be cancelled only in leap years.

- ② Set the date with the **SET (+/-)** and **SHIFT (NEXT/BACK)** buttons.
- ③ To cancel the preset date, move the cursor to the relevant date with the **SHIFT (NEXT/BACK)** buttons and press the **CANCEL** button.
- ④ To return to the normal display mode, press the **PRG/CLK**.

INSTANT TIMER RECORDING

After you start recording, the recorder can be set to stop automatically after a certain period of time.

Press REC button while recording (or twice if in the Stop mode).

- The following indication will appear on the display, to show that the recorder is recording in the Instant Timer Recording mode and power will switch off after 30 minutes.

REC STOP

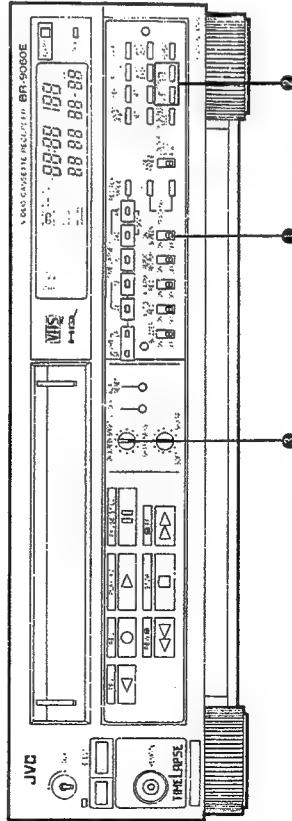
For a more precise time setting, use the SET +/- and SHIFT/NEXT/BACK buttons to set to the exact time required.

- After '0:30' has appeared, press to set to the exact time required.
- Press REC button so that the digits stop blinking.

0:30

- After '0:30' has appeared, press to set to the exact time required.
- Press REC button so that the digits stop blinking.

TIME/DATE GENERATOR



The built-in time/date generator allows the time and date to be superimposed on the video image and recorded.

Set the CLOCK TIME accurately as described on Page 12.

- Set the ON SCREEN switch to ON.

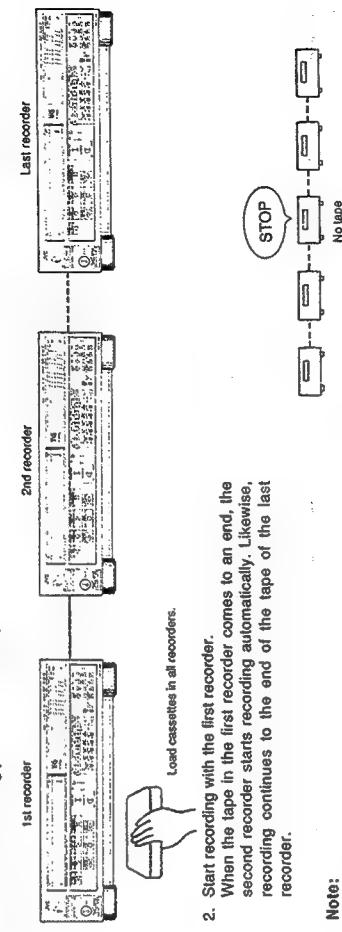
- Move the cursor to the appropriate position on the screen with the TDG "H" and "V" Position buttons. The cursor can be moved to the left in 13 steps by pressing the "H" button. The cursor can be moved up the screen in 16 steps by pressing the "V" button. When the cursor is at the left or top of the screen, the next time the button is pressed, it will return to the right or bottom of the screen.

SERIES RECORDING

Series recording refers to successive recording with more than one recorder, allowing unattended recording for an extended time.

OPERATION

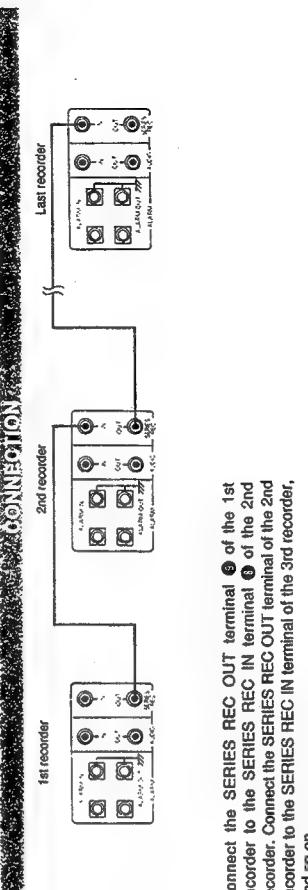
- Load cassettes in the required number of recorders and locate the starting position for each tape.



Note:

- If a cassette is not loaded in one of the recorders, series recording stops there.

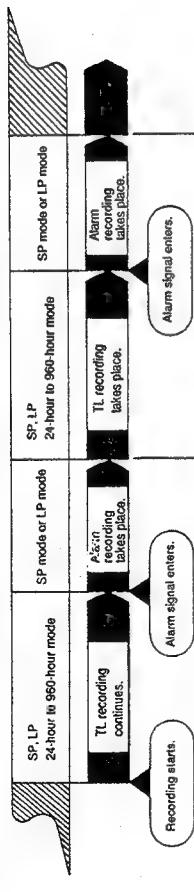
CONNECTION



- Connect the SERIES REC OUT terminal ① of the 1st recorder to the SERIES REC IN terminal ② of the 2nd recorder. Connect the SERIES REC OUT terminal of the 2nd recorder to the SERIES REC IN terminal of the 3rd recorder, and so on.

ALARM RECORDING

When an unusual incident is observed in the scene being recorded in the Time Lapse mode and an alarm is given, the recording mode changes automatically to a faster speed for more detailed coverage of the incident.



- An alarm sensor can be connected across the ALARM INPUT and GND terminals.
- Set the REC/PLAY MODE button to TL 24, 72, 120, 240, 480, or 960.
- Set the ALARM REC switch to ON.

SPECIFICATIONS

GENERAL		AUDIO	
Recording system	Luminance — FM	Number of tracks	1
Signal system	Chroma — Down-converted	Input	-8 dBs, RCA
Tape speed	PAL/CCIR, 625 lines	Output	-6 dBs, RCA
	23.39 mm/s (VHS SP)	S/N ratio	40 dB (at 3% distortion)
Record/Play time	11.70 mm/s (VHS LP)		
	3, 6, 24, 72, 120, 240, 480		
Operating temperature	5°C to 40°C	Display	Day, month, year, hours, minutes, seconds, Recording mode
Storage temperature	35 % to 80 %	Character size	16H
Power requirement	-20°C to 60°C	Power backup	Approx. one year
Power consumption	220-240 V AC, 50/60 Hz		
Dimensions	30 watts		
	435(W) x 124(H) x 370(D) mm		
VIDEO		ALARM	
Input	0.5 to 2.0 Vp-p, 75 ohms, unbalanced, BNC	Alarm input	Ground input
Output	1.0 Vp-p, 75 ohms, unbalanced, BNC	Alarm output	Alarm input through-out
	Colour-240 lines (VHS SP)	Camera switching	
Horizontal resolution	BM-300 lines (VHS SP)	Output	Negative pulse output (approx. 5 ms), BNC
S/N ratio	More than 43 dB (VHS SP)		
SERIES RECORDING		TIME/DATE GENERATOR	
Series input	Ground input, RCA	Display	Day, month, year, hours, minutes, seconds, Recording mode
Series output	Series input through-out, RCA	Character size	16H
Accessories	"R6 batteries x 5	Power backup	Approx. one year
	Remote control unit x 1		
	Switch cover x 1		
	Lock key x 2		

IN CASE OF DIFFICULTY

Symptom	Cause	Remedy
No power is applied to the recorder.	• Power cord is unplugged.	• Plug in the power cord.
Tape control buttons do not function.	• • TIMER switch is set to ON.	• Release the key lock and set the TIMER switch to OFF.
Playback picture does not appear while tape is running.	• Monitor is not connected correctly.	• Check the connections.
Noise bars are visible during playback.	• • TRACKING control is not correctly adjusted.	• Turn the TRACKING control slowly in either direction to move the noise bars off the screen.
Playback picture is blurred or interrupted.	• Video heads may be dirty.	• Head cleaning is necessary. Consult your nearest JVC dealer.
No audio is available during playback.	• No audio signal is recorded during TL recording.	• Check the mode in which the tape was recorded.
Recording is not possible.	• Safety tab is removed from the cassette.	• Change the cassette to one with safety tab in place.
Timer recording is not possible.	• • TIMER indicator is off.	• Press the TIMER switch set to ON. • First set the clock time correctly, then program the timer.

SECTION 1

DISASSEMBLY

1.1 REMOVING OF EXTERNAL COVERS

- **Top cover**

Remove six screws **(A)**.

- **Front panel assembly**

1. Remove the top cover.
2. Disengage three upper hooks of the front panel ass'y by lifting them upward.
3. Remove the front panel ass'y in a manner to turn it to this side.

- **Operation board**

1. Remove the front panel.
2. Remove six screws **(C)** and then remove the front lock and the cover bracket.

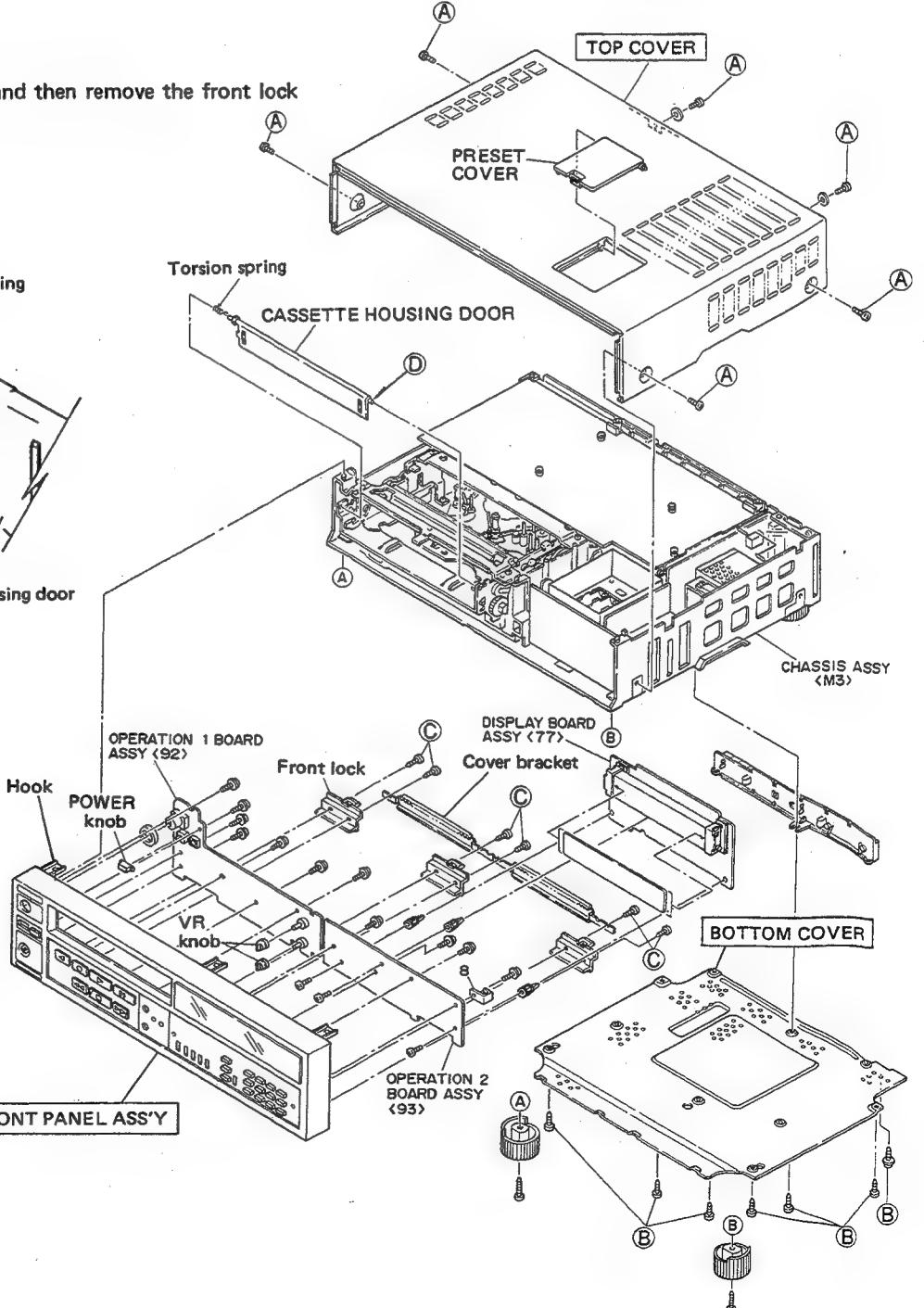
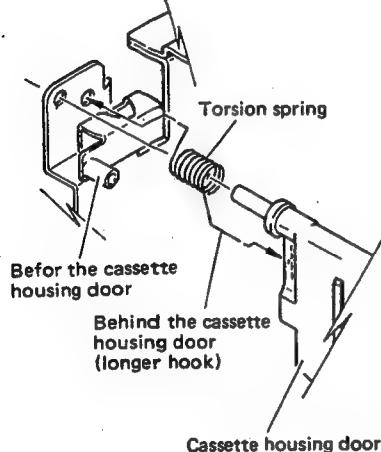


Fig. 1-1 Removing of external covers

1.2 REMOVING OF MAIN BOARDS

Board No.	Board Name
0 1	SWITCHING P.S
0 2	REGULATOR
0 4	MAIN <VIDEO Y SECTION> <VIDEO C SECTION>
0 5	<AUDIO SECTION>
0 6	D/C SERVO
0 7	TIMER LAPSE SERVO
0 8	MECHA CON
0 9	TIME LAPSE SUB SERVO (1)
1 0	TIME LAPSE SUB SERVO (2)
1 2	VIDEO SUB
4 1	A/C HEAD
4 3	UPPER DRUM
	VIDEO PRE/REC
5 1	DECK TERMINAL
5 2	RELAY
5 3	REC SAFETY
5 4	END SENSOR
5 6	CASSETTE HOUSING
7 4	ON SCREEN DATA/BATTERY (1)
7 5	ON SCREEN DATA/BATTERY (2)
7 6	REAR
7 7	DISPLAY
7 8	CLEANER
7 9	TIMER
9 2	OPERATION 1
9 3	OPERATION 2

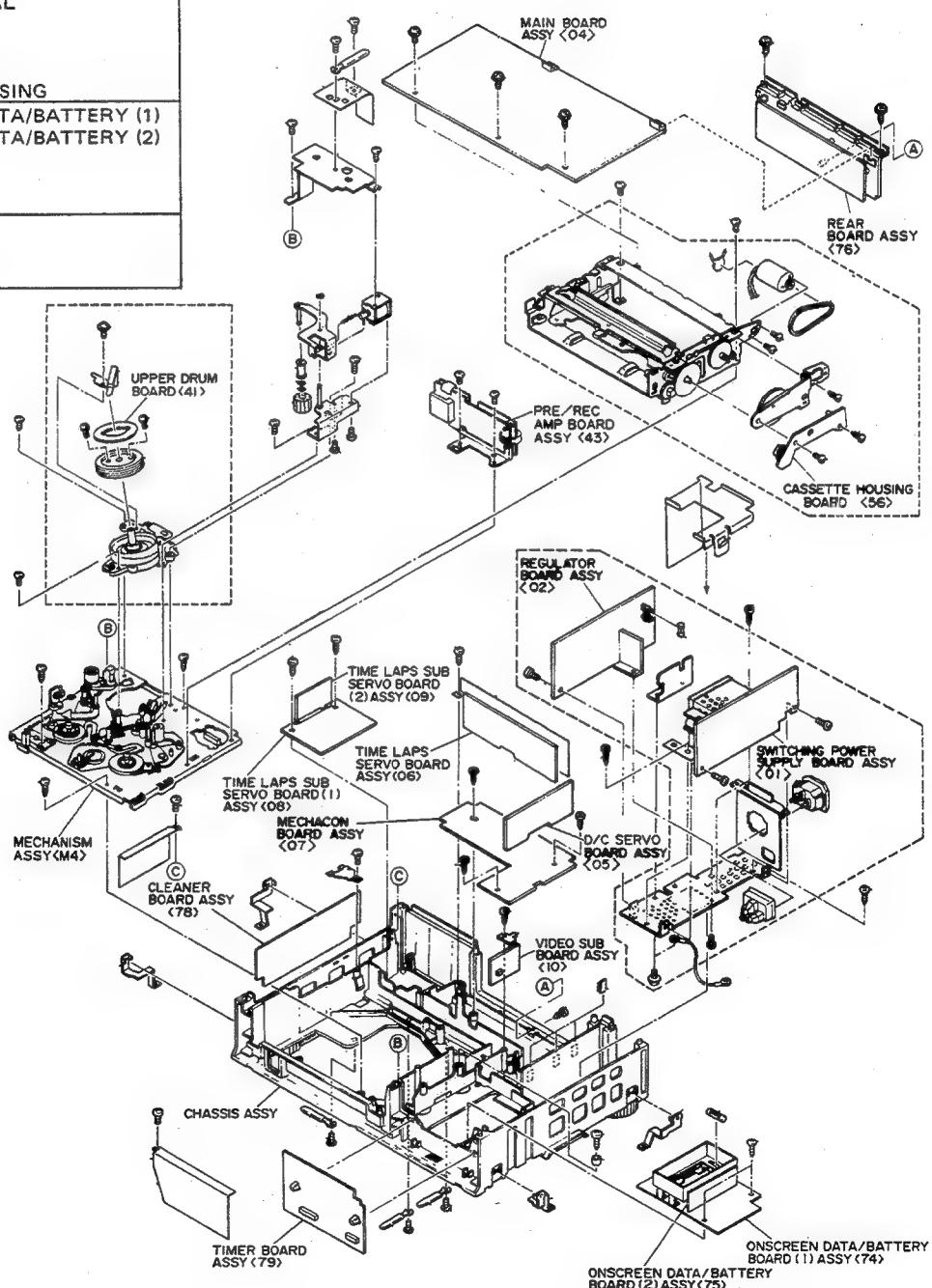


Fig. 1-2 Removing of main boards

1.3 REMOVING OF MAIN BOARD

1. Remove the top cover.
2. Refer to Fig. 1-3 and take out 3 screws (E) from main board assembly.

Note: Make sure not to remove the screws indicated by the asterisk (*) mark.

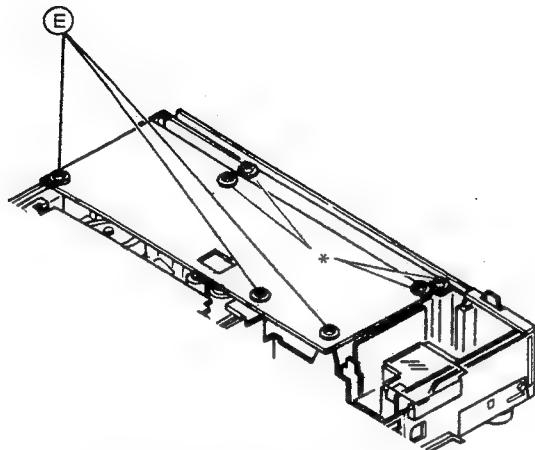


Fig. 1-3 Removing of MAIN board

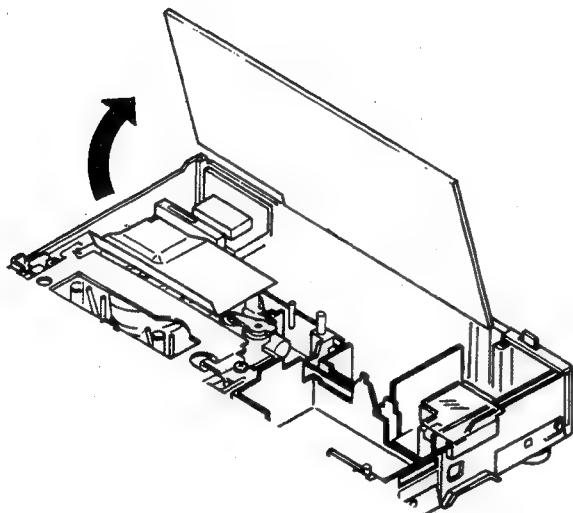
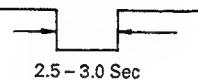


Fig. 1-4 How to lift up MAIN BOARD

1.4 REFERENCE

• SERIES REC PULSE

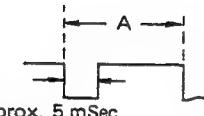
SERIES REC OUT



2.5 - 3.0 Sec

• CAM SW PULSE

CAM SW OUT (Rear Panel)



Approx. 5 mSec

DIP SW		PULSE OUT INTERVAL A
(4)	(5)	
ON	ON	40 mSec (1 Frame)
ON	OFF	80 mSec (2 Frame)
OFF	ON	1.0 Sec (25 Frame)
OFF	OFF	2.0 Sec (50 Frame)

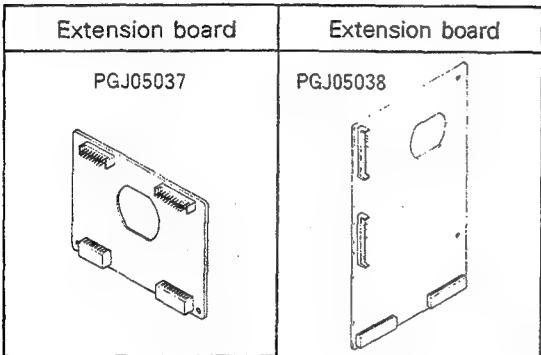
• TIME LAPSE REC INTERVAL

REC MODE	REC INTERVAL
24 H	9 FRAME (180 mSec)
72 H	25 FRAME (500 mSec)
120 H	41 FRAME (820 mSec)
240 H	81 FRAME (1620 mSec)
480 H	161 FRAME (3220 mSec)

1.5 USAGE OF EXTENSION BOARD

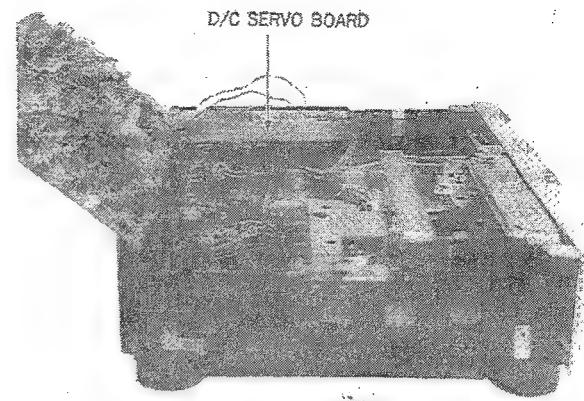
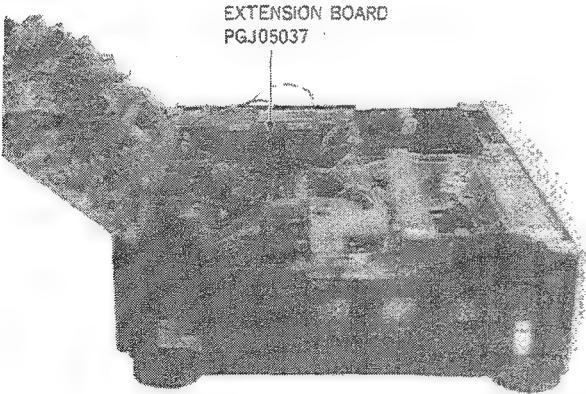
Two kinds of extension boards are prepared for BR-9060. They are not required for adjustment but necessary for troubleshooting and checkup in repair.

- Extension board for
D/C SERVO board : PGJ05037
- Extension board for
TIME LAPSE SERVO board : PGJ05038



1.5.1 Connection of extension board PGJ05037

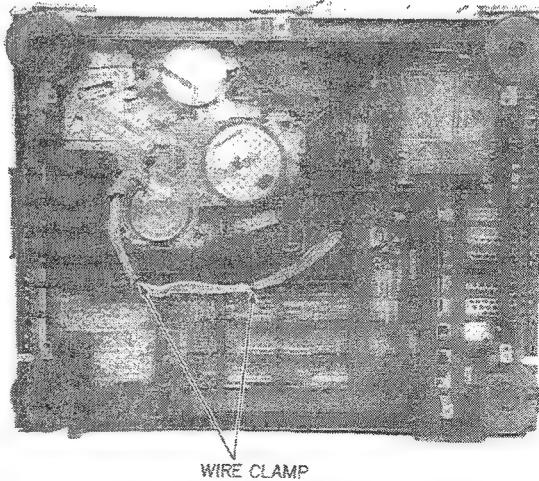
1. Take off the top cover.
2. Remove three screws from the A/V board and turn it up to open.
3. Disconnect connectors from the D/C SERVO board.
4. When disconnecting the D/C SERVO board from the MECHA CTL board, carefully disconnect the connectors not to hurt hands since they are tightly connected.
5. Install the extension board and replace the D/C SERVO board horizontally as it was. Then, connect all connectors between them.



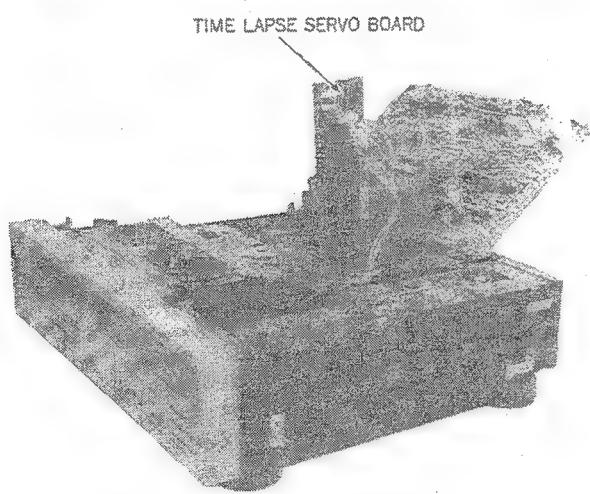
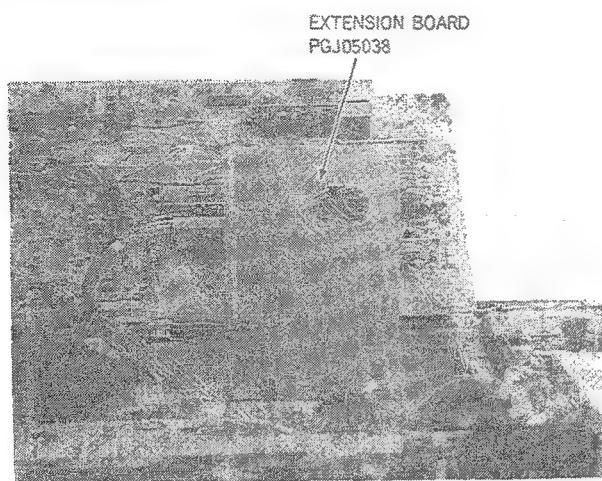
6. In the products whose serial numbers are before 320, the shield wire assy between the D/C SERVO board and the TIME LAPSE SERVO board may be at the very limit to do the above-mentioned connection work. (The shield wire assy of the serial No. 320 and after is a little longer.)

1.5.2 Connection of extension board PGJ05038

1. Take off the top cover.
2. Remove three screws from the A/V board and turn it up to open.
3. Disconnect all connectors from the TIME LAPSE SERVO board.
4. Remove eight screws retaining the bottom cover and take it off.
5. Release the shield wires of the capstan motor from the wire clamps in the bottom of the main deck.



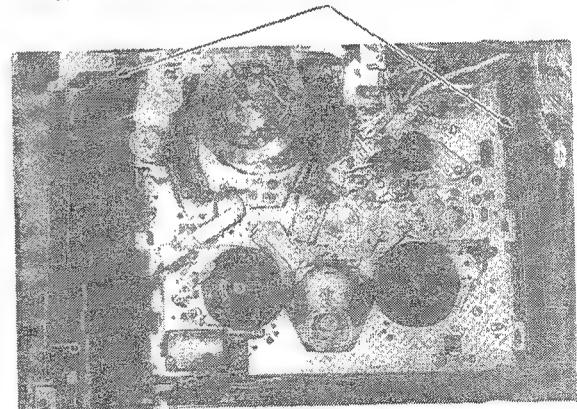
6. Disconnect the TIME LAPSE SERVO board from the MECHA CTL board with care not to hurt hands since the two boards are tightly connected by connectors. It is recommended to disconnect them after removing two screws retaining the REAR board assy and the A/V board assy.
7. Place the extension board vertically and replace the TIME LAPSE SERVO board as it was. Then, carefully pull the shield wires of the capstan motor and connect all connectors.



1.6 REMOVAL OF MAIN DECK

1. Take off the top cover.
2. Remove three screws from the A/V board and turn it up to open. (Refer to Section 1.3.)
3. Remove the drum cover assy.
4. Remove the cassette housing assy. (Refer to Section 2.2.)
5. Detach the cleaner assy and leave it in the left of the original position.
6. Disconnect wires including two earth wires from the A/C head, and remove the earth terminal.
7. Disconnect flat wires coming from the mechacon from the main deck. (Refer to Section 2.8.6.)
8. Remove two screws retaining the PRE/REC board and lift the board upward while removing it.
9. Disconnect the connector from the upper part of the full erase head.
10. Take off the bottom cover and disconnect connectors for the capstan motor. (Refer to Section 1.5 (2).)
11. Remove three screws retaining the main deck.
12. Push the locks of the chassis assy in the both sides of the main deck while lifting the main deck by the front side of it.

Push the locks while lifting the main deck upward.



Note: To separate the main deck completely from the whole assembly, disconnect connectors which connect it respectively with the lower drum and the heater.

SECTION 2

MECHANISM ADJUSTMENT

2.1 GENERAL

2.1.1 Precautions

IMPORTANT:

1. Disconnect unit from power before removing or soldering components.
2. When removing a fastener (screw, washer, etc.), be careful not to drop it into the mechanism. If a fastener should be dropped, be sure to retrieve it.
3. The tape transport mechanism has been precisely adjusted at the factory and ordinarily does not require readjustment.
4. When removing a part, be very careful not to damage or displace other parts. (Be especially careful with the tape guides and rotary video head drum.)
5. For service procedures that set for the Play mode when the cassette housing is separated from the main-deck, perform as below.
 - 1) Set a sheet of insulated material on the top of chassis.
 - 2) Remove the cassette housing from the main-deck and place it on the insulated sheet, but do not disconnect the housing connector.
 - 3) Cover the cassette LED on the main-deck with an opaque cover.
 - 4) The Play mode can be obtained by using the Play switch without a cassette tape.

2.1.2 Required test equipment, fixtures and tools

For proper mechanical adjustment, the following test equipment, fixtures and tools are strongly recommended. Without them, a long trial-and-error period would be necessary, resulting in possible damage. In addition, general-purpose tools are required.

1. Test equipment required:

Color television or monitor

Oscilloscope: Wide-band, dual trace, triggered, delayed sweep

Recording tape

Alignment tapes

Alignment tape MHPE, MHPE-L, MBPE-X	Cassette torque meter PUJ42881	A/CTL head position tool PUJ47351-2
Parallel check plate PUJ50204		

Table 2-1-1 Fixtures and tools

2.1.3 Layout of main parts

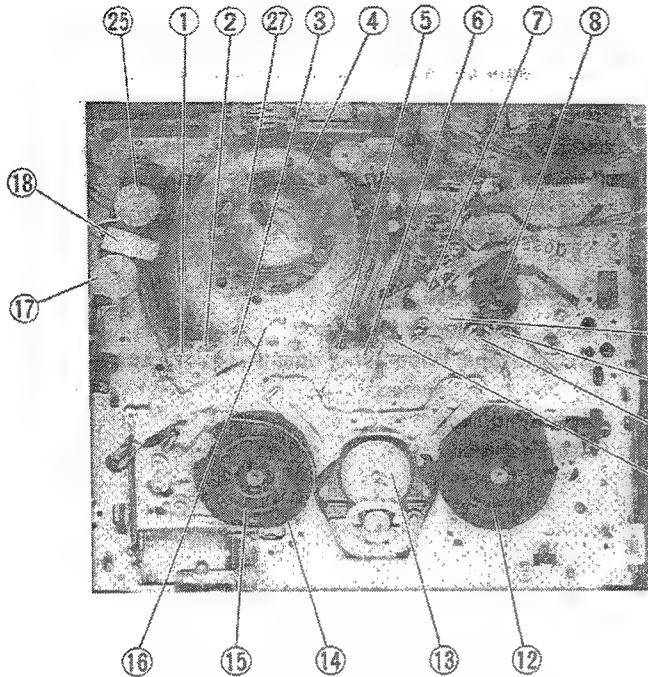


Fig. 2-1-1 Top view of main-deck

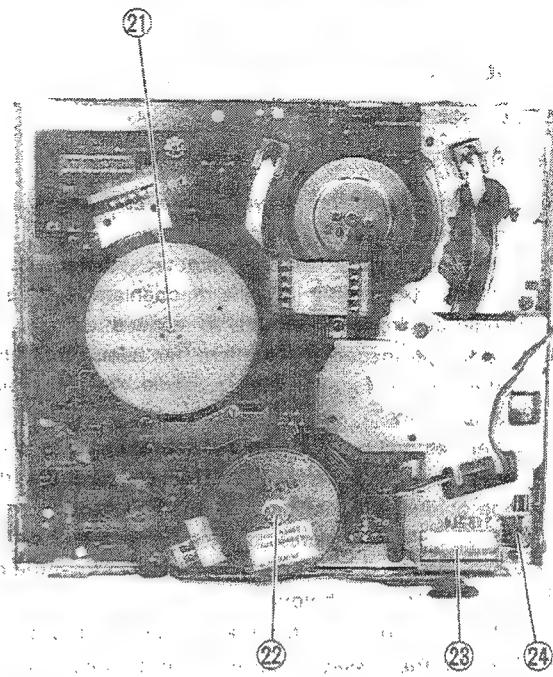


Fig. 2-1-2 Bottom view of main-deck

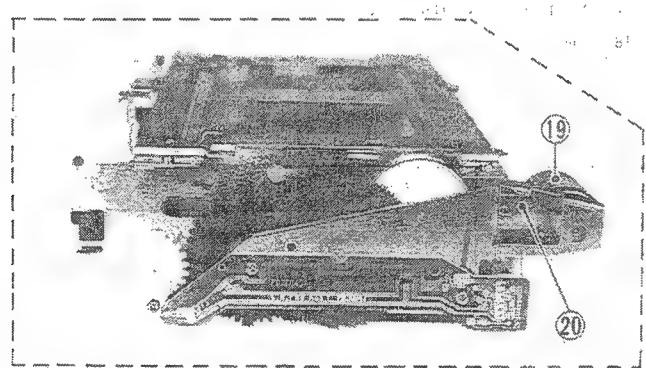


Fig. 2-1-3 Cassette housing

- 1. Supply guide roller
- 2. Supply slant pole
- 3. Tension arm assy
- 4. Upper drum assy
- 5. Take-up slant pole
- 6. Take-up guide roller
- 7. A/C head
- 8. Pinch roller arm assy
- 9. Take-up guide pole
- 10. Guide arm assy

- 11. Capstan shaft
- 12. Take-up reel disk
- 13. Idler arm
- 14. Tension band assy
- 15. Supply reel disk
- 16. Lower drum assy
- 17. Impedance roller
- 18. Full erase head
- 19. Cassette motor
- 20. Cassette belt

- 21. Capstan motor
- 22. Reel motor
- 23. Mode motor
- 24. Mode belt
- 25. Roller assy
- 26. Half loading arm assy
- 27. Brush assy

2.1.4 Main parts replacement table

Periodic inspection and maintenance are needed in order to ensure performance and reliability. The following table has been compiled simply to give a general idea regarding maintenance and inspection. In practice, the periods indicated will vary widely according to environmental and usage

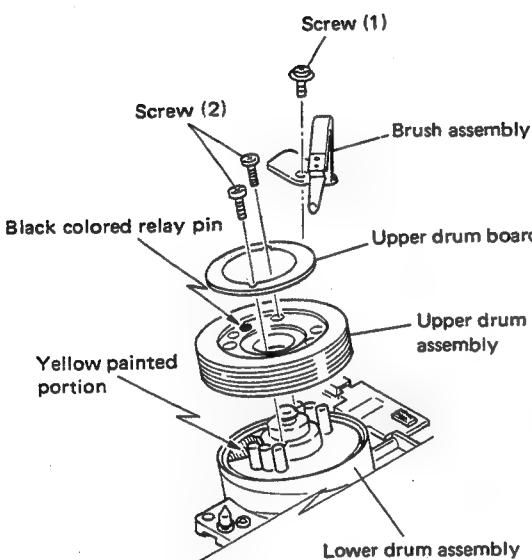
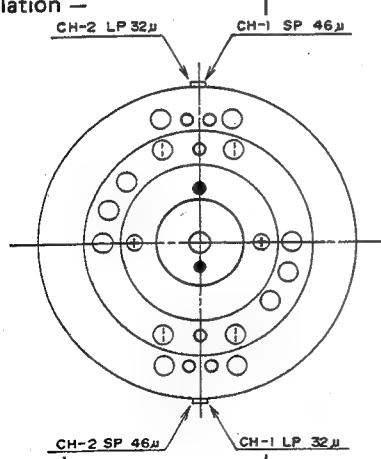
conditions. Also be aware that rubber parts may deform and age even when the equipment is not used. The upper drum life is particularly affected by environmental and usage conditions.

No.	Parts Name	Parts No.	Periodic servicing schedule (operating hours)								Ref. sect.	Remarks
			1000	2000	3000	4000	5000	6000	7000	8000		
Tape transport system												
1	Tension pole ass'y	PQ43710A	★	★	★	★	★	★	★	●	2.2.1	Perform cleaning with finely woven cloth or gauze moistened in alcohol. Confirm that the cleaned locations are thoroughly dry before operating the deck. For lubrication, use sewing machine oil or good quality spindle oil. After cleaning with alcohol, apply 1 or 2 drops of oil.
2	Supply slanted pole	Ass'y No.	★	★	★	●	★	★	★	●		
3	Supply guide roller	PU60556-1-2	★	★	★	●	★	★	★	●		
4	Impedance roller	PQ41955	★	★	★	●	★	★	★	●		
5	Take-up guide pole	PU53629-3	★	★	★	○	★	★	★	●		
6	Capstan shaft	—	★	★	★	★	★	★	★	★		
7	Take-up guide roller	Ass'y No.	★	★	★	●	★	★	★	●		
8	Take-up slanted pole	PGZ01143	★	★	★	★	★	★	★	●		
9	Lower drum ass'y	PDM2035V-23	★	★	★	●	★	★	★	●		
10	Upper drum ass'y	PDM2170A	○	●	○	●	○	●	○	●		
11	Full erase head	PU60646	★	★	★	★	★	★	★	●		
12	A/C head	PU60560-2	★	★	★	●	★	★	★	●		
13	Pinch roller arm ass'y	PQ42006B	★	★	★	●	★	★	★	●		
Driving system												
14	Capstan motor	PGZ01300	★	○	★	●	★	○	★	●	2.2.2	2.2.7
15	Reel motor	PGZ01332		●		●		●		●		
16	Mode motor	PQ41996B				○				●		
17	Mode belt	PQM30003-20		○		●		○		●		
18	Cassette motor	PQ42385A				○				●		
19	Cassette belt	PQM30003-19		○		●		○		●		
20	Idler arm	PU58645-1-4	★	●	★	●	★	●	★	●		
21	Supply main brake	PQ42019B-6				○				●		
22	Take-up main brake	PQ42020B				○				●		
23	Take-up sub brake	PQ42037A-2				○				●		
24	Supply sub brake	PQ42021A-3				○				●		
25	Supply reel disk	PU59250-1-2		△		△		△		△		
26	Take-up reel disk	PU58638-1-2		△		△		△		△		
Others												
27	Brush ass'y	PDM4015B				●				●	2.2.1	2.2.3
28	Tension band	PQ41948A		○		●		○		●	2.2.3	
29	Head cleaner	PRD40510-01-02	●	●	●	●	●	●	●	●		

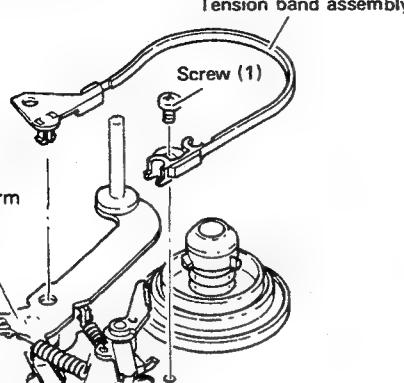
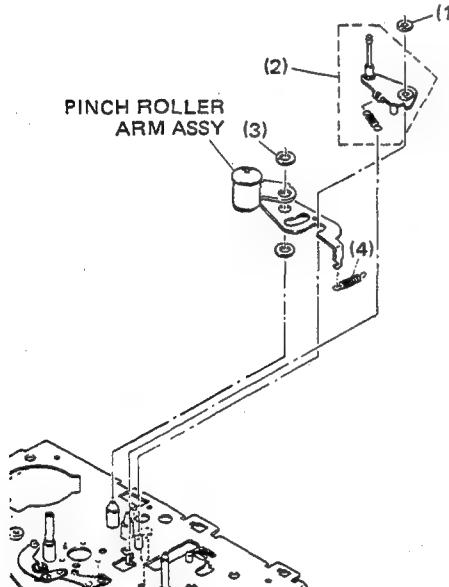
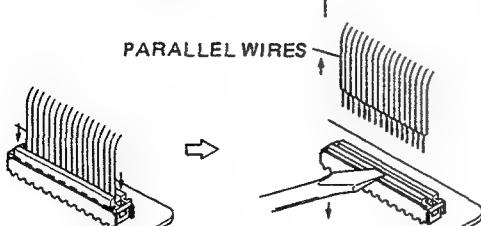
(★ = Cleaning. ○ = Check, or replace if necessary. ● = Replacement. △ = Lubricate.)

Table 2-1-2 Main parts maintenance and replacement standard

2.2 MAIN ASSEMBLY REPLACEMENT

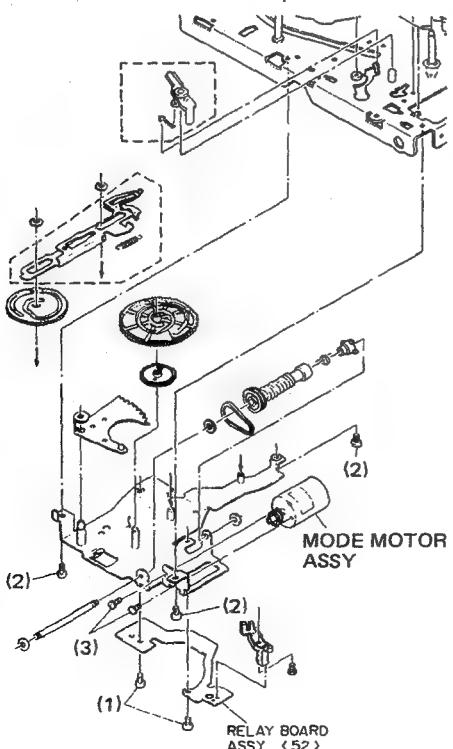
No.	Item	Adjustment parts	Operating mode	Description
1	Upper drum assembly			<p>Note: When installing the new upper drum, use care not to touch the video heads. If heads are soiled, clean with a soft, finely woven cotton cloth or chamois that has been moistened in alcohol. Hold lightly against the heads and turn the drum clockwise. By no means clean with a vertical stroke.</p> <p>1) Refer to Fig. 2-2-1. Take out screw (1) and remove the brush assembly.</p> <p>2) Use a desoldering tool or desoldering braid to unsolder the upper drum boards.</p> <p>3) Take out two screws (2) and raise the upper drum to remove it together with the upper drum board. (If this drum is to be re-installed, use care not to touch or damage the heads.)</p>
	— Removal —			
	Fig. 2-2-1 Upper drum assembly			
	— Installation —			<p>1) Refer to Fig. 2-2-1. Align the black relay pin of the new upper drum with the yellow marking of the lower drum.</p> <p>2) Reinsert screws (2) and tighten them in a balanced manner.</p> <p>3) Reinstall and solder the upper drum boards.</p> <p>4) Clean the drum assemblies (see above note).</p> <p>5) Reinstall the brush assembly and secure with screw (1).</p>
				
	— Checks and adjustments —			<p>After installing the upper drum, perform the following checks and adjustments (refer to appropriate Sections of this Manual).</p> <ol style="list-style-type: none"> 1) FM waveform (Section 2.6.1) 2) Servo circuit (Section 3.4) 3) Video circuit (Section 3.7, 3.5)

No.	Item	Adjustment parts	Operating mode	Description
2	A/C head (Audio/Control head)			<p>– Removal –</p> <p>1) Disengage connectors attached to the A/C head board. 2) Take out two screws (1) and remove the A/C head together with the head base. 3) Unsolder and remove the A/C head board from the A/C head. 4) Take out three screws (3) and remove the A/C head from the head base. Use care regarding the three springs.</p> <p>Fig. 2-2-2 A/C head</p>
			– Installation –	<p>1) Install the A/C head by reversing the removal steps of above. 2) Temporarily set the A/C head height above the head base for 6.5 mm (see Fig. 2-2-3).</p> <p>approx. 6.5 mm</p> <p>Head base</p> <p>Fig. 2-2-3 A/C head height</p>
			– Checks and adjustments –	<p>1) Use a spare tape (not Alignment tape) and confirm proper operation of the tape transport (see Section 2.5). 2) Perform interchangeability adjustment (see Section 2.6).</p>

No.	Item	Adjustment parts	Operating mode	Description
3	Tension band assembly			<p>1) Take out screw (1) and disengage the tension band assembly from the tension arm assembly (see Fig. 2-2-4).</p> <p>2) Remove and replace the tension band assembly.</p> <p>3) Perform tension pole position adjustment (see Section 2.4).</p>
				 <p>Fig. 2-2-4 Tension band assembly</p>
4	Pinch roller arm assembly			<p>1) Take out a slit washer (1) and remove the guide arm assembly (2).</p> <p>2) Take out a slit washer (3) and the tension spring (4).</p> <p>3) Remove and replace the pinch roller arm assembly.</p> <p>4) Secure with a new slit washer (3) (PQM30017-28).</p> <p>5) Reassemble by reversing the above steps.</p>
				 <p>Fig. 2-2-5 Pinch roller assembly</p>
5	PARALLEL WIRES			<p>1) Press the clamp as shown and remove the wires.</p>
				 <p>Fig. 2-2-6</p>

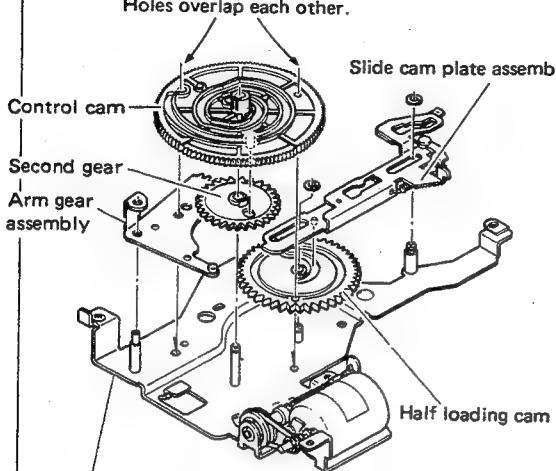
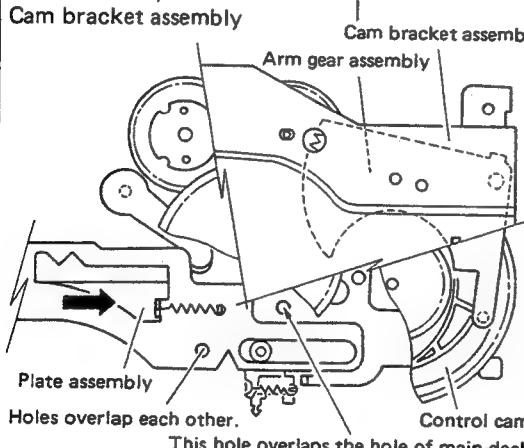
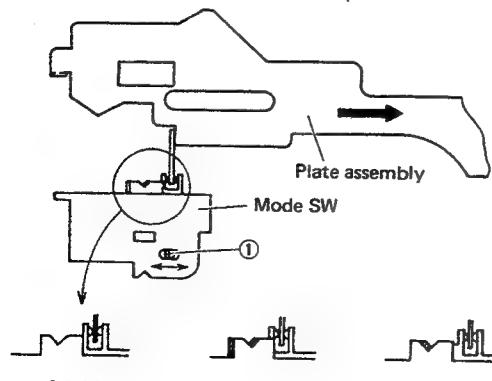
No.	Item	Adjustment parts	Operating mode	Description
6	Reel motor and idler arm			<p>1) Disengage the main brake assembly first, by using pliers, pull out one to straight up to remove them.</p> <p>2) Disengage the spring (1) from the idler arm and move the idler arm in the direction of the arrow to remove it.</p> <p>3) Unsolder the wire from reel motor.</p> <p>4) Take out two screws (2) and replace the reel motor assembly.</p> <p>5) Reassemble by reversing the above steps.</p>
7	Mode motor assembly			<p>1) Refer to Fig. 2-2-8. Take out two screws (1) and raise the relay board assembly.</p> <p>2) Take out three screws (2) securing the cam bracket sub-assembly to the main deck.</p> <p>3) Unsolder the wire from mode motor.</p> <p>4) Take out two screws (3) and replace the mode motor assembly. Reassemble by reversing the above steps.</p> <p>5) Engage the rubber belt with the pulley.</p>

Fig. 2-2-7 Reel motor and idler arm



2.3 ASSEMBLY PROCEDURE OF MECHANISM

No.	Item	Adjustment parts	Operating mode	Description
1	Loading arm assemblies			<p>A close relationship exists between the mode select switch and the mechacon circuit. Therefore, the mode select switch and control arm engagement determines the overall mechanical operations of the levers, gears, rollers, etc. If these parts are not properly positioned, the video deck becomes stalled in the unloading or Stop mode.</p> <p>Take-up loading arm assembly</p> <p>Supply loading arm assembly</p> <p>Fig. 2-3-1 Loading arm assembly</p> <p>Holes confront each other.</p> <p>(Black) (White) (To supply pole base)</p> <p>(To take-up pole base) Supply loading arm assembly</p> <p>Take-up loading arm assembly</p> <p>Fig. 2-3-2 Bottom view of loading arm assembly</p> <p>These assemblies are comprised of loading gears, torsion springs and loading arms.</p> <ol style="list-style-type: none"> 1) Refer to Fig. 2-3-1 and install the loading arm assemblies correctly. 2) The take-up and supply loading arm positions with respect to the loading gear holes are indicated in Fig. 2-3-2. This configuration is important to allow shifting to the next operation.

No.	Item	Adjustment parts	Operating mode	Description
2	Control cam	Holes overlap each other.	Slide cam plate assembly	<p>1) Install the half loading cam on the cam bracket assembly, then mount the slide cam plate assembly so that its stud sets into the groove on the half loading cam.</p> <p>2) Install the arm gear assembly on the cam bracket assembly.</p> <p>3) Assemble the second gear and the control cam so that the stud of the control cam sets into the hole of the second gear.</p> <p>4) Mount the above assembly (control cam and second gear) on the cam bracket assembly to satisfy the relation indicated in figure.</p> <p>5) Do not turn the control cam from this position for the next step as shown 2.3.3 Cam bracket assembly.</p>
	 <p>Fig. 2-3-3 Control cam</p>			
3	Cam bracket assembly	Cam bracket assembly Holes overlap each other. This hole overlaps the hole of main-deck.	Arm gear assembly Plate assembly Control cam	<p>1) Refer to Fig. 2-3-4 and press the plate assembly toward the right to overlap the indicated holes with that of the main deck.</p> <p>2) Then install the cam bracket assembly.</p> <p>Note: If the arm and loading gears do not mesh properly, use a jeweler's screwdriver or similar tool to engage the gear teeth while installing the cam bracket assembly.</p>
	 <p>Fig. 2-3-4 Cam bracket assembly</p>			
4	Mode switch position	Plate assembly Mode SW	GOOD NG NG	<p>1) Engage the plate assembly and mode switch as shown in Fig. 2-3-5. Partially tighten screw (1) to where the switch can still be shifted for adjusting the position.</p> <p>2) Press the plate assembly toward the right to where the holes are overlapped as in Fig. 2-3-4. Insert a jeweler's screwdriver into the holes to keep them aligned.</p> <p>3) Shift the mode switch to align the V-notch as indicated in Fig. 2-3-5. Then tighten screw (1) to secure.</p> <p>4) Remove the jeweler's screwdriver, then reinstall and solder the circuit board.</p>
	 <p>Fig. 2-3-5 Mode switch</p>			

2.4 CONFIRMATION AND ADJUSTMENT

No.	Item	Adjustment parts	Operating mode	Description
1	Tension pole position			<p>1) Without a cassette housing, set for the Play mode (see Section 2.1.1).</p> <p>2) Refer to Fig. 2-4-1. Slightly loosen screw (1). Adjust the tension band holder position for 0 mm separation between the tension arm and cutout position.</p> <p>3) Tighten screw (1) to secure the tension band holder.</p> <p>4) Use the cassette torque meter and set for the Play mode.</p> <p>5) Check for a scale reading between 28 and 42.</p> <p>6) If outside this range, clean the tension band contacting portions of the supply reel disk with alcohol, or check the condition of the tension arm spring. If necessary, replace the tension band assembly.</p>
2	Take-up torque			<p>1) Use the cassette torque meter and set for the Play mode.</p> <p>2) Confirm a value between 45 and 155.</p> <p>3) If outside this range, clean the rubber portion of the idler arm with alcohol, if necessary, or check the reel motor drive circuit.</p>

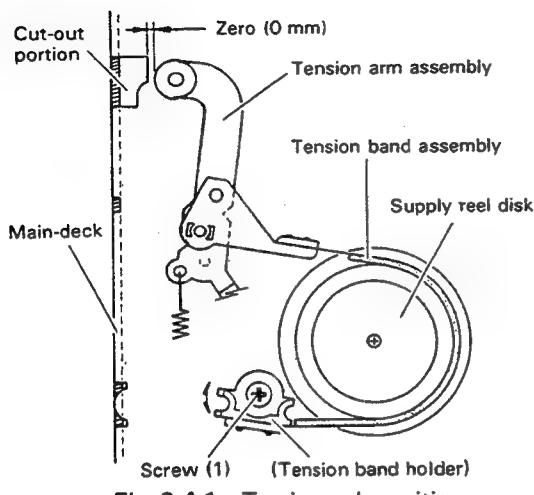
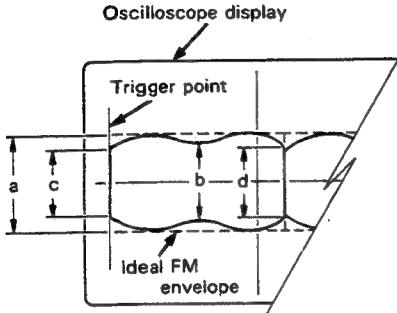
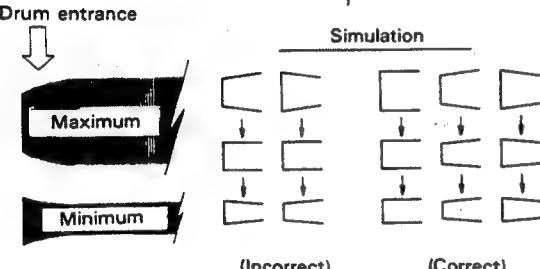
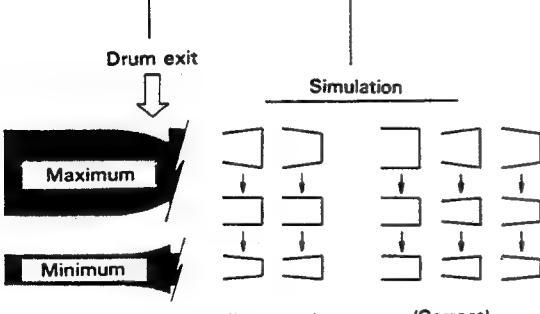


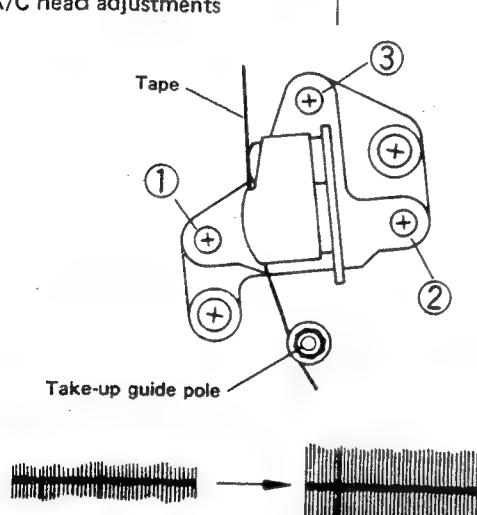
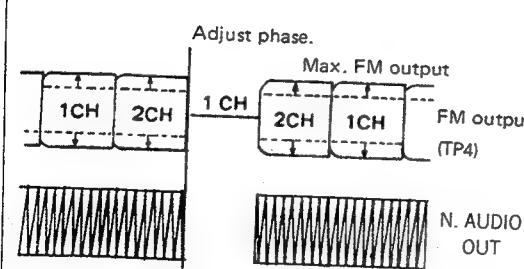
Fig. 2-4-1 Tension pole position

2.5 TAPE TRANSPORT CHECKS AND ADJUSTMENT PREPARATIONS

No.	Item	Adjustment parts	Operating mode	Description
		The tape transport system has been precision-adjusted at the factory and ordinarily does not require readjustment. However, adjustment may become necessary after long term usage or after replacing parts that affect the tape transport. The following steps mainly cover preparations for the interchangeability adjustments of Section 2.6.		
1	Guide roller	Turn with screw-driver.		<p>1) During interchangeability adjustments, the guide roller is turned with a flat-blade screwdriver to adjust its height and correct FM waveform linearity. Use a metric hex key (1.25 mm) to slightly loosen the setscrew at the base of the guide roller (see Fig. 2-5-1). Loosen the setscrew just sufficiently to allow the guide roller to be turned. If too loose, tape transport will be too unstable to permit correct adjustment.</p>
		<p>Fig. 2-5-1 Guide roller</p>		
2	Impedance roller	Turn with nut-driver.		<p>1) This compensates for tape running stability between the cassette and head drum. After adjusting the supply guide roller, the impedance roller height is adjusted for smooth tape transport at the lower flange.</p> <p>2) Use a metric nutdriver (5.5 mm) to adjust by turning the upper nut (see Fig. 2-5-2). However, note that excess turning can disturb the FM waveform stability.</p>
		<p>Fig. 2-5-2 Impedance roller</p>		
3	A/C head (audio/control head)	Turn this screw to obtain smooth tape travel.		<p>1) After adjusting the take-up guide roller, adjust the A/C head inclination for smooth tape travel at the lower flange of the take-up guide pole. Refer to Fig. 2-5-3.</p>
		<p>Fig. 2-5-3 A/C head</p>		

2.6 INTERCHANGEABILITY CHECKS AND ADJUSTMENTS

No.	Item	Adjustment parts	Operating mode	Description
1	FM waveform	$\frac{b}{a} \geq 0.8, \frac{c}{a} \geq 0.7$ and $\frac{d}{a} \geq 0.7$		<p>Before using costly Alignment tape, use a spare tape and confirm correct operation of the tape transport.</p> <p>Fig. 2-6-1 FM envelope</p>  <p>Fig. 2-6-2 Drum entrance</p>  <p>Fig. 2-6-3 Drum exit</p>  <p>1) Connect an oscilloscope to TP4 of the video PRE/REC board [4] [3]. Trigger the oscilloscope externally with the signal from TP7 of the D/C board [0] [5].</p> <p>2) Playback the MHPE Alignment tape and adjust the tracking for maximum FM waveform output. Refer to Fig. 2-6-1. Confirm the relationships indicated in the figure for maximum output (a), minimum center output (b), minimum output at the drum intake (c) and minimum output at the drum output (d).</p> <p>3) Adjustment is required if the above specifications are not fulfilled. Even when these are fulfilled, check that the FM waveform varies linearly overall. If not, slight deviation in tracking will cause a large proportional level drop to result in noise appearing in the picture. Therefore, in this condition, proceed to the following checks and perform adjustments where necessary.</p> <p>4) Operate the tracking adjustment between minimum and maximum outputs of the FM waveform. Observe the portion of the waveform corresponding to the drum intake (see Fig. 2-6-2). As the tracking is adjusted, although the gain may increase or decrease, the geometric shape of this part of the waveform should remain consistent. If the shape varies, as shown by the incorrect examples in the figure, carefully perform adjustment of the supply guide roller height.</p> <p>5) Next observe the portion of the waveform corresponding to the drum output (see Fig. 2-6-3), while operating the tracking adjustment. This should also vary only in gain, but not in shape. If the shape varies, as shown by the incorrect examples in the figure, carefully perform adjustment of the take-up guide roller height.</p> <p>6) Check the overall FM waveform. Fine-adjust both guide rollers so that variation is as minimum and linear as possible.</p> <p>7) Observe the tape travel at the guide rollers and guide poles. Confirm absence of tape creasing or curling. Confirm that the tape properly rides at the lower flange of the supply guide pole. Carefully adjust the guide pole height if necessary. This adjustment is important and affects FM waveform response.</p> <p>If creasing or curling is observed at the take-up guide pole, carefully adjust the audio/control head inclination so that the tape rides properly at the lower flange of the guide pole. Finally, again check the FM waveform.</p>

No.	Item	Adjustment parts	Operating mode	Description
2	A/C head adjustments	<p>Proper adjustment of the A/C head position is important for ensuring adequate audio output and S/N. Severe misalignment can prevent control signal pick-up and cause servo instability. Precise adjustment is particularly important for models that include tape indexing and addressing features, since these rely on control signal coding for operation. To observe the audio signal, connect an oscilloscope to the test point (AUDIO OUT) of the audio circuit, or directly to the audio output terminal. In some cases, monitoring the sound with headphones may be helpful.</p>  <p>Fig. 2-6-4 A/C head</p>	<ol style="list-style-type: none"> 1) Playback the MHPE Alignment tape. 2) Adjust screw (3) (Fig. 2-6-4), which is the azimuth adjustment, for maximum output. 3) Turn screws (1), (2) and (3) by small and equal increments (about 45° at a time) to adjust the A/C head height for maximum audio output. Slightly raise and lower the height to confirm the maximum output position. 4) Observe the FM waveform and tighten the guide roller set-screws. Use care not to disturb the height adjustments. Then again confirm the FM waveform is not affected. 	
3	Control head phase (X-value)	<p>When X-value is incorrectly adjusted, it results in time lag between reproduced image and sound when tape recorded by a VTR whose X-value is correctly adjusted is played back. This is more clearly observed in LP PB mode than the standard PB mode.</p> <p>Connect a probe of an oscilloscope to a test point (TP4 or TP3 [for LP mode] on the PRE/REC board) on the video PB circuit and the other probe to the NORMAL AUDIO OUT for observing FM waveform. In addition, set the tracking control to the center position.</p>  <p>Fig. 2-6-5 Interchangeability Control head phase adjustment</p>	<ol style="list-style-type: none"> 1) Play back the MBPE-X alignment tape. 2) Slightly loosen the screws ④ and ⑤ of the A/C head, and put the A/C head positioning jig (PUJ47351-2) on the screw ④ while inserting the jig's pin into the hole nearby the screw. (See Fig. 2-6-4.) 3) Adjust the position of the A/C head so that both phases of audio waveform and FM waveform coincide with each other in the non-recorded part and the FM output becomes nearly the maximum. 4) Remove the positioning jig and then tighten the screws ④ and ⑤. 5) Play back the MHPE alignment tape, and adjust the tracking control while confirming the maximum FM waveform at the center click position. 6) When the FM waveform is not maximum with the tracking control set at the center position in playback of the MHPE alignment tape, move the A/C head to FM MAX position nearest the position obtained in the above step 3). 7) Play back the MHPE-L alignment tape. 8) Adjust R60 (DC Servo board) to maximize so that the FM output level. 	

No.	Item	Adjustment parts	Operating mode	Description
4	Final checks			<ol style="list-style-type: none"> 1) Input video signal (B/W signal is preferable) to record it, and play it back to confirm that the PB waveform meets the standard of video FM waveform (see Fig. 2-6-1). Perform this check both in the standard and LP PB modes. 2) Referring to the Section 3 Electrical Adjustment, proceed to check and adjust the servo circuit, video circuit and audio circuit totally.

SECTION 3

ELECTRICAL ADJUSTMENTS

3.1 PREPARATION

Electrical adjustments are required after replacing circuit components and certain mechanical parts.

It is important to perform these adjustments only after all repairs and replacements have been completed. Also, do not attempt these adjustments unless the proper equipment is available.

3.1.1 Required test equipment

1. Color television or monitor
2. Oscilloscope: wide-band, dual-trace, triggered delayed sweep
3. Frequency counter
4. Audio tester
5. Digital voltmeter
6. Signal generator: PAL color bar, stairstep, video sweeper
7. Recording tape
8. Alignment tape: MHPE, MH-2, MHVE-2, MHAE
9. Head resonance adjust coil: PTU94004A
10. RF sweep signal generator (100 kHz – 10 MHz)

3.1.2 Check and adjustment steps

The check and adjustment steps are provided in the following in the form of charts. For clarity, the nomenclature used in the charts is outlined below.

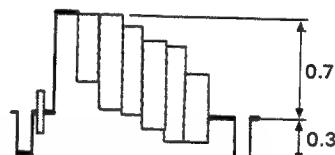
No.	Checks and adjustments are numbered in the recommended sequence in which they are to be performed.
Item	Name assigned to the particular check and adjustment step.
Check Point	Location to which measuring instrument (oscilloscope unless otherwise noted) is to be connected.
Adjustment Parts	Variable component (resistor, capacitor, etc.) to be adjusted in this step. Dash (–) indicates check only.
Signal & Mode	<ul style="list-style-type: none"> • Input signal required to perform adjustment. Dash (–) indicates that special signal is not required. • Equipment operating mode at time of check or adjustment.

Color bar	Color bar signal as video input.
Stairstep	Stairstep signal as video input.
1 kHz	1 kHz sinewave as audio input signal.
E-E	Power on and machine in Stop mode.
REC	Recording mode
PB	Playback mode
SLOW	Slow motion playback mode
STILL	Pause during playback mode
VHS mode	VHS SP mode
VHS mode	VHS LP mode
TIME LAPSE mode	24, 72, 120, 240, 480, 960 H mode
Description	This column provides an explanation of the step, notes and adjustment values.

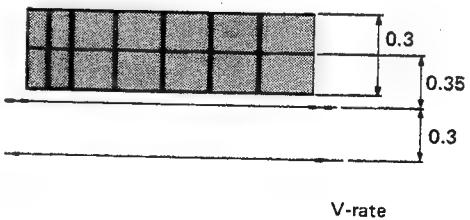
Note: Unless otherwise noted, supply a VIDEO signal to LINE IN (BNC connector).

3.1.3 Required test signal

- EBU 75% colour bars



- Video sweep (100 kHz – 5 MHz)



- Sweep



3.1.4 Alignment tape specifications

- MH-8

No.	PB time	Video signal	Audio signal	Description
1	2 min.	Colour sweep	400 Hz (-10 dB)	for check and adjustment of frequency characteristic in video PB circuits
2	2 min.	"	100 Hz (-10 dB)	for check and adjustment of frequency characteristic in audio PB circuits
3	2 min.	"	8 kHz (-10 dB)	
4	4 min.	"	-	

- MHPE

Video signal	Audio signal	Description	
VHS SP mode Stairstep	6 kHz	for check and adjustment of interchangeability for check and adjustment of the servo circuit for adjustment of audio head azimuth	Usable in place of MH-2 stairstep

- MHVE-2

Video signal	Audio signal	Description	
VHS SP mode Colour bars	-	for check and adjustment of video signal PB circuits	Usable in place of MH-2 colour bars

- MHAE

Video signal	Audio signal	Description	
-	1 kHz (0 dB)	for check and adjustment of audio signal PB circuits	Usable in place of MH-2 1 kHz signal

3.1.5 Factory switches setting

- Front side

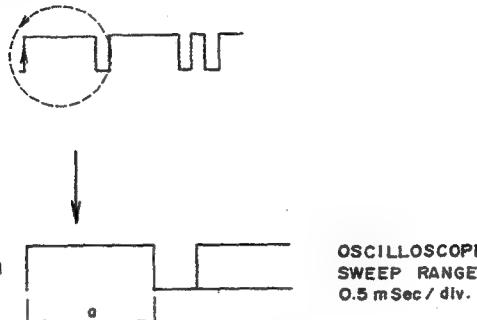
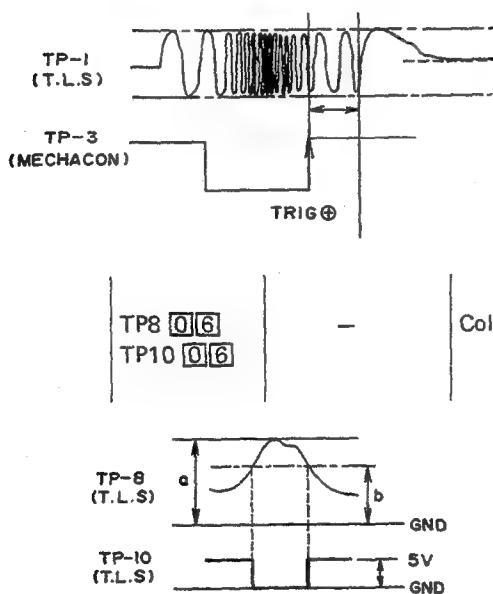
ON SCREEN BRIGHT : Center
 SHARPNESS : Center
 BUZZER : OFF
 AUTO REC : OFF
 ALARM REC : OFF
 REPEAT REC/PLAY : OFF
 ON SCREEN : ON
 VIDEO MODE : AUTO

- Rear side

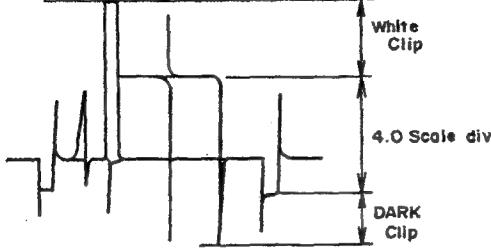
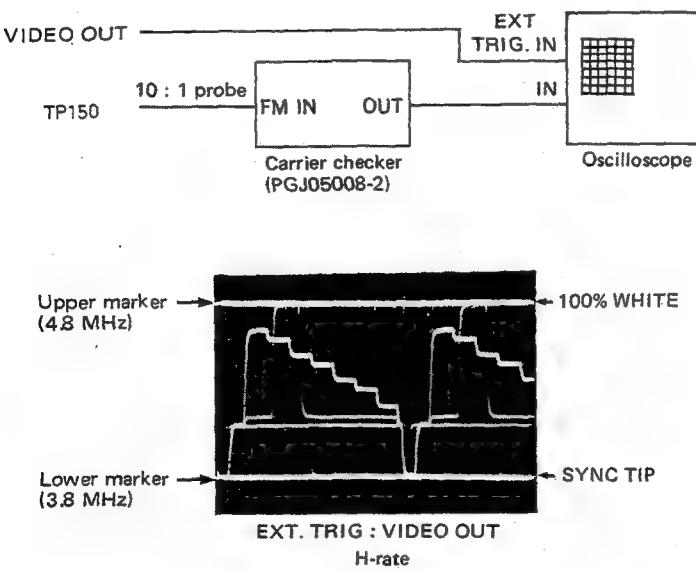
V. PULSE : OFF
 DIP SW (1, 3 - 8) : ON
 DIP SW (2) : OFF

No.	Item	Check Point	Adjustment Parts	Signal	Mode	Description
4	V. pulse check	TP7 [0.5] VIDEO OUT (75-ohm terminated)	—	MHVE-2	Search (X 2) PB	<p>1) Connect the oscilloscope to TP7 (D. FF) [0.5] for external trigger (— slope). 2) Change the initial setting of the following switch. V. PULSE SW : ON 3) Play back the alignment tape MHVE2 in the Search mode. 4) In the left figure, where, 'T₁' is the pulse width between the falling point of D. FF (TP7) and that of the V. pulse of the VIDEO OUT, 'T₂' is the width of the V. pulse, and 'a' and 'b' interpret the waveform of the VIDEO OUT, confirm the following things.</p> <p>$T_1 = 290 \pm 30 \mu\text{sec}$ $T_2 = 190 \pm 20 \mu\text{sec}$ $a = 0 \pm 30 \text{ mV}$ $b = 290 \pm 40 \text{ mV}$</p> <p>5) Change the initial setting of the following switch. V. PULSE SW : OFF 6) Play back the alignment tape, and confirm that there is no V. pulse generated in waveform of the VIDEO OUT. 7) Change the initial setting as follows. V. PULSE SW : ON 8) Play back the color bar segment of the alignment tape, and confirm that there is the same V. pulse as observed in the step 4) impressed. 9) Change the setting of the V. PULSE SW to OFF.</p>
5	Index check	TP3 [0.5]	—	Color bar	REC ↓ PB	<p>1) Connect the oscilloscope to TP7 (D. FF) [0.5] for external trigger. 2) Change the initial setting as follows. REC MODE SW : TL 24H ALARM REC SW : ON 3) Record the color bar signal. 4) In the recording, shortcircuit the ALARM terminal. 5) Play back the recorded tape from the recording start point. Observing the waveform and assuming that $T_2 = 10$ (see the figures on the left), confirm that $T_1 = 2.5-3.0$ ($27.5 \pm 2.5\%$) in the period of 2 sec after the shorting of the ALARM terminal. 6) In the period that 2 sec have passed after the switching of the mode, confirm that $T_1 = 5.5 - 6.5$ ($60 \pm 5\%$) on condition that $T_2 = 10$.</p>

No.	Item	Check Point	Adjustment Parts	Signal	Mode	Description
6	Capstan FG duty adj.	TP3 [0] [6] TP4 [0] [6]	R10 [0] [6] R4 [0] [6]	Color bar	REC	<p>1) Connect the oscilloscope to TP3 and adjust R10 so that the waveform shown on the left meets the following specifications. $a = 5.0 \pm 0.5 \text{ V}$ $b = b' (50 \pm 5\% \text{ duty})$</p> <p>2) Connect the oscilloscope to TP4 and adjust R4 for the same purpose of the above step 1).</p> <p>Note: If there are fluctuations in the measured values, adjust by the center value respectively.</p>
7	Stop servo level adj.	TP6 [0] [6] TP GND [0] [6]	R43 [0] [6] R38 [0] [6] R45 [0] [6]	—	REC	<p>1) Connect the oscilloscope to TP6 and set the mode to REC with a E-180 cassette tape loaded.</p> <p>2) Adjust R43 so that a and a' of the waveform of TP6 are equalized with each other ($a = a' [50 \pm 5\%]$).</p> <p>3) Alternately adjust R38 and R45 so that the waveform of TP6 meets the following specifications. $B = 3.0 \pm 0.2 \text{ VDC} \bigcirc R45$ $C = 6.0 \pm 0.5 \text{ Vp-p} \bigcirc R38$</p> <p>Note: If there is stepping down/up in the waveform, adjust by the higher level as it is the criterion. If there is fluctuation in the measured value, adjust by the center value.</p>
		TP7 [0] [6] TP GND [0] [6]	—	—	STOP	4) Connect the oscilloscope to TP7 and confirm no fluctuation in the waveform level. (at the stabilized voltage)
8	Slow F-V converter adjustment	TP8 [0] [6] TP GND ↓ Digital voltmeter	R56 [0] [6]	MHPE	PB	1) Adjust R56 to obtain $3.90 \pm 0.05 \text{ V DC}$ as voltage at TP8.
9	F-V converter center voltage adjustment	TP12 [0] [6] TP GND ↓ Digital voltmeter	R62 [0] [6]	MHPE	PB	1) Adjust R62 to obtain $2.5 \pm 0.1 \text{ V DC}$ as the voltage at TP12.

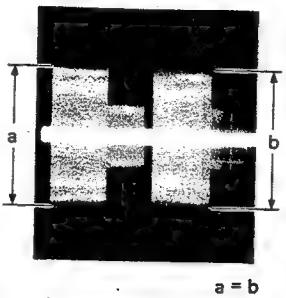
No.	Item	Check Point	Adjustment Parts	Signal	Mode	Description
10	F-V limiter adjustment	TP11 0 6	R87 0 6	Color bar	REC (24H)	<p>1) Connect the oscilloscope's CH1 probe to TP11. (Trigger: INT +, Sweep mode: NORMAL)</p> <p>2) Change the initial switch setting as follows. REC MODE SW : TL 24H</p> <p>3) Adjust R87 so that the width 'a' of the waveform of TP11 becomes 2.8 msec.</p>  <p>OSCILLOSCOPE SWEEP RANGE 0.5 msec / div.</p>
11	Tape transport amount adj.	TP1 0 6 TP3 0 7	R75 0 6 R38 0 6 R45 0 6	Color bar	REC (24H)	<p>1) Change the initial switch setting as follows. REC MODE SW : TL 24H</p> <p>2) Connect the CH-1 probe of the dual-trace oscilloscope to TP1 while its CH-2 probe to TP3 for external trigger on the pulse (+) slope.</p> <p>3) Confirm that the waveform of TP1 is stabilized 2-3 pulses after the rise point of the TP3's pulse. (2 ± 1 pulses)</p> <p>4) If the condition is out of the step 3), adjust as follows.</p> <ul style="list-style-type: none"> Number of pulses: Adjust R75 and confirm the steps 5) and 6). Stability of waveform: Adjust R38 and R45. Confirm the stop servo level adj. (No. 7) <p>5) Connect the oscilloscope to TP10, TP8 trigger it externally. (+ slope, TP8 0 5 D/C servo, NORMAL)</p> <p>6) Confirm that the section 'a' of the waveform of TP8 becomes 3.2 ± 0.3 V DC. At the same time, confirm that 'b' is 1.4 ± 0.15 V DC.</p> <p>Note: Perform the adjustment with the beginning of the tape.</p> 

No.	Item	Check Point	Adjustment Parts	Signal	Mode	Description
12	TL REC CTL position	TP1 <input type="checkbox"/> 8 TP2 <input type="checkbox"/> 8	R101 <input type="checkbox"/> 9 R104 <input type="checkbox"/> 9	Color bar	REC TL24H PB TL 24H	<p>1) Input the color bar signal and record it. REC MODE SW : TL 24H</p> <p>2) Connect the oscilloscope's CH-1 to TP1 and CH2 to TP2.</p> <p>3) Adjust R104 so that 'a' of the waveform is 46 msec. (a = 46 msec) (ext. trigger: TP2, - slope)</p> <p>4) Adjust R101 so that 'b' becomes 15 msec. (b = 15 msec) (Trigger: INT, + slope)</p> <p>5) Connect the oscilloscope probes to TP4 and TP7.</p> <p>6) Maximize FM level by pressing the TRACKING button. At the same time, the FM level should be adjusted to be 4 scale divisions on the oscilloscope screen.</p> <p>7) Then, press the TRACKING buttons simultaneously for tracking preset, and confirm that the FM level is 3.2 scale divisions or more.</p> <p>8) If not, vary the value 'a' of the above step 3) first and repeat the steps 5) through 7).</p>
13	TL skew adj.	TP3 <input type="checkbox"/> 8	R106 <input type="checkbox"/> 9 R111 <input type="checkbox"/> 9 R126 <input type="checkbox"/> 9	Color bar	REC TL24H (TL72H) REC TL72H (TL24H) REC TL24H (TL72H) ↓ PLAY SP	<p>Note: The above-mentioned adjustment should be applied only to the sets whose serial numbers are 1888 and after. For the sets whose serial numbers are 1887 and before, perform the adjustment according to directions in the parentheses.</p> <p>1) Connect the oscilloscope to TP3 with external trigger from TP8 (- TRIG, <input type="checkbox"/> 5 NOR). REC MODE SW : TL24H (TL72H)</p> <p>2) Pick up the Philips pattern and record it on the beginning portion of recording tape.</p> <p>3) Adjust R106 so that T = 15.0 msec while adjust R111 so that A = 3.7 msec.</p> <p>4) Secondly, set the REC MODE switch to TL72H and perform the same recording as the the above.</p> <p>5) Adjust R126 so that A = 3.4 msec.</p> <p>6) Thirdly, set the REC MODE switch to TL24H(TL72H) again, and record the Philips pattern and play it back in the SP mode.</p> <p>7) Set the AFC switch of the TV monitor to NORMAL while the PULSE CROSS switch to ON. Observe the monitor to confirm that it has symmetric horizontal fluctuation in the edge portions of the both sides.</p> <p>8) If not, it deflects rightward by increasing A, while deflects leftward by decreasing A. Note: It tends to deflect rightward as a whole.</p> <p>9) Set Record in the same manner with the REC MODE switch set to TL24(TL72H), and play it back in the SP mode.</p> <p>10) Repeat the above steps 7) and 8).</p> <p>Note: Unless there is particular skew observed in the picture, do not disturb the setting of these VRs. Different skew appears owing to AFC of TV monitor used.</p>

No.	Item	Check Point	Adjustment Parts	Signal	Mode	Description
6	White & Dark clip	TP35 0[4]	—	Pulse & Bar	EE (SP)	<p>1) Connect the oscilloscope to TP35, and adjust the GAIN VR of the oscilloscope so that the level between the 100% white and the sync. tip is 4.0 scale divisions.</p> <p>2) At that time, confirm the following values.</p> <p>A (WHITE CLIP): 3.4—4.0 scale divisions B (DARK CLIP) : 1.4—2.2 scale divisions</p> 
7	Carrier & Deviation	TP50 0[4]	—	Color bar	EE	<p>1) Connect the oscilloscope and the carrier checker as shown in the figure on the left.</p> <p>2) Set the level between the upper marker and the lower marker for 8.0 scale divisions on the oscilloscope screen.</p> <p>3) Confirm that difference of the sync. tip is ± 0.8 scale division to the lower marker.</p> <p>4) Confirm that difference of the 100% white is ± 0.8 scale division to the upper marker.</p> 
8	Color mode REC FM level	TP6 4[3]	R95 0[4]	Color bar	REC (SP)	<p>1) Record the color bar signal.</p> <p>2) Adjust R95 so that the pedestal level is 3.0 Vp-p.</p> 
9	B/W mode REC FM level	TP6 4[3]	R214 0[4]	Gray scale	REC (SP)	<p>1) Adjust R214 so that the pedestal level is 3.5 Vp-p.</p> 

No.	Item	Check Point	Adjustment Parts	Signal	Mode	Description
10	SP mode REC/PB color level adjustment	TP307 ① ①	—	MHVE-2	PB	<p>1) Play back the MHVE-2.</p> <p>2) Adjust the TRACKING control to maximize the level of the waveform, and assume that the level of a channel having the larger waveform is 'a' as shown in the figure (1 : 1 probe used).</p> <p>3) If the level 'a' is set for 5.0 scale divisions on the oscilloscope screen, confirm that the smaller level 'b' is more than 3.5 scale divisions (channel difference is 3 dB).</p> <p>Note: Leave the oscilloscope's VR as it was set for the above step.</p> <p>4) Press the both of the TRACKING buttons (+, -) simultaneously for tracking preset.</p> <p>5) Record the color bar signal and play it back to confirm the waveform. If correlation between the waveforms of two channels is the same as that of the step 3), proceed to do the adjustment of the step 6) below. On the other hand, if the correlation is contrary to the above step 3), proceed to do the adjustment of the step 7).</p> <p>6) In case the correlation between the waveforms is the same as that of the step 3): Adjust R355 so that the level of the larger channel is 5.0 scale divisions (0 dB) to the level 'a' (5.0 scale divisions).</p> <p>7) In case the correlation between the waveforms is contrary to that of the step 3): Adjust R355 so that the level of the larger channel satisfies the value in accordance with the table on the left.</p> <p>8) In the same manner as in the step 3) above, confirm that the level of the smaller channel is more than 3.5 scale divisions if the level of the larger channel is 5.0 scale divisions. If the correlation of channel difference between the playback levels of the alignment tape and self-recorded tape is contrary, confirm that the channel difference between the two playback levels is within 3 dB.</p> <p>9) Return the oscilloscope's VR to the original setting position.</p> <p>Note: Connect the oscilloscope to TP7 (D. FF) ⑤ for external trigger.</p>

No.	Item	Check Point	Adjustment Parts	Signal	Mode	Description
11	LP mode REC/PB color level adjustment	TP307 ① ②	—	MH-2L (Color bar)	PB	<p>1) Play back the color bar segment of the alignment tape MH-2L.</p> <p>2) Connect the oscilloscope to TP307 (with 1 : 1 probe used).</p> <p>3) Adjust the TRACKING control to maximize the waveform, and assume that the level of a channel having the larger waveform is 'a' as shown in the figure (measured by respective average values).</p> <p>4) If the level 'a' is set for 5.0 scale divisions on the oscilloscope screen, confirm that the smaller level 'b' is more than 3.5 scale divisions (channel difference is 3 dB).</p> <p>5) Press the both of the TRACKING buttons (+, -) simultaneously for tracking preset.</p> <p>6) Change the initial switch setting as follows. REC MODE SW : LP</p> <p>7) Record the color bar signal and play it back to confirm the waveform. If correlation between the waveforms of two channels is the same as that of the step 4), proceed to do the adjustment of the step 8) below. On the other hand, if the correlation is contrary to the above step 4), proceed to do the adjustment of the step 9).</p> <p>8) In case the correlation between the waveforms is the same as that of the step 4): Adjust R353 so that the level of the larger channel is 5.0 scale divisions (0 dB) to the level 'a' (5.0 scale divisions).</p> <p>9) In case the correlation between the waveforms is contrary to that of the step 4): Adjust R353 so that the level of the larger channel satisfies the value in accordance with the table on the left.</p> <p>10) In the same manner as in the step 4) above, confirm that the level of the smaller channel is more than 3.5 scale divisions if the level of the larger channel is 5.0 scale divisions. If the correlation of channel difference between the playback levels of the alignment tape and self-recorded tape is contrary, confirm that the channel difference between the two playback levels is within 3 dB.</p> <p>11) Return the oscilloscope's VR to the original setting position.</p> <p>Note: Connect the oscilloscope to TP7 (D. FF) ③ ④ for external trigger.</p>



TP307 ① ② R353 ③ ④

Color bar

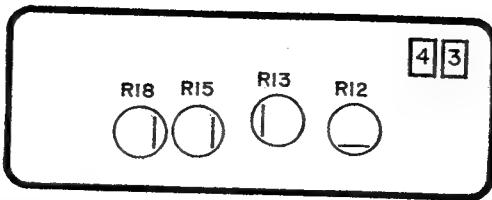
REC
↓
PB
(SP)

No.	Item	Check Point	Adjustment Parts	Signal	Mode	Description
12	PB Y level adj.	VIDEO OUT	R91 ①④	Color bar	REC ↓ PB (SP)	<p>1) In the SP mode, record the color bar signal inputted through the VIDEO IN and play it back.</p> <p>2) Connect the oscilloscope to the VIDEO OUT with 75-ohm terminator and adjust R91 so that the output level is 1.0 Vp-p.</p>
13	Sharpness preset adj.	TP24 ①④	R42 ①④	B/W sweep	EE (SP)	<p>1) Input the B/W sweep signal to the VIDEO IN in the SP mode and set the deck to EE.</p> <p>2) Connect the oscilloscope to TP24, and short-circuit between the emitter and collector of Q17 of the MAIN board with a shorting lead.</p> <p>3) Take note of the frequency response of the 2 MHz signal.</p> <p>4) Remove the shorting lead.</p> <p>5) Adjust R42 to obtain the same signal level as that taken note of in the above step 3).</p> <p>Note: Perform the adjustments with the SHARPNESS VR set at the center position.</p>
14	SP video frequency response	VIDEO OUT	R130④③	B/W sweep	REC (SP) ↓ PB (SP)	<p>1) Connect the oscilloscope's probe to the VIDEO OUT with 75-ohm terminator.</p> <p>2) Record the signal and play it back both in the SP mode.</p> <p>Confirm that the SHARPNESS control is set at the center position.</p> <p>3) Perform measurement based on the channel having the higher level.</p> <p>When the 100 kHz level is set for 5.0 scale divisions on the oscilloscope, adjust the 2.0 MHz level to be 4.5 scale divisions by R130. At that time, confirm that the level difference between channels is within 2 dB.</p> <p>4) Record the color sweep signal and play it back both in the SP mode.</p> <p>5) Measure in the same channel as the step 3).</p> <p>6) When the 100 kHz level is set for 5.0 scale divisions, confirm that the 2.0 MHz level is 3.9 to 6.0 scale divisions.</p> <p>Note: Measure the frequency response by the center of fine noise outside the noise that is on the 2 MHz marker and has clear contour.</p>

No.	Item	Check Point	Adjustment Parts	Signal	Mode	Description
15	LP video frequency response	VIDEO OUT VIDEO OUT	R131 [4] [3] —	B/W sweep Color sweep	REC (LP) ↓ PB (LP) REC (LP) ↓ PB (LP)	<p>1) Record the B/W sweep signal and play it back both in the LP mode. Confirm that the SHARPNESS control on the front panel is set at the center position.</p> <p>2) Perform measurement based on the channel whose level is higher than the other. When the 100 kHz level is set for 5.0 scale divisions on the oscilloscope, adjust the 2.0 MHz level to be 3.5 scale divisions by R131. At that time, level difference between the channels must be within 2 dB.</p> <p>3) Record the color sweep signal and play it back both in the LP mode.</p> <p>4) Measure in the same channel as the step 2).</p> <p>5) When the 100 kHz level is set for 5.0 scale divisions on the oscilloscope, confirm that the 2.0 MHz level is 2.8 to 4.5 scale divisions.</p> <p>6) Again confirm that the SP video frequency response with the B/W sweep signal is correct.</p>
16	APC error phase	TP305 TP328	T301 [0] [4]	Color bar	REC (SP) ↓ PB (SP)	<p>1) Connect one channel of a dual trace oscilloscope to TP305 while the other channel to TP328. Trigger the oscilloscope external (— slope) with the signal from TP12 (H. SYNC). (oscilloscope : CHOP MODE)</p> <p>2) Adjust T301 to position the zero-cross 30 μsec \pm 3 μsec from the center of the burst signal as shown in the figure.</p> <p>Note: For the above procedure, use a ceramic adjusting tool.</p>
17	0.5H delayed video signal	VIDEO OUT (75-ohm terminated)	R9 [0] [4] (IC6 Module)	Color bar	REC (LP) ↓ PB (LP) ↓ STILL	<p>1) Connect the oscilloscope to the VIDEO OUT with 75-ohm terminator.</p> <p>2) Record the color bar signal and play it back both in the LP mode.</p> <p>TRACKING SW : PRESET</p> <p>3) In the LP Still mode, adjust R9 (inside IC6 Module) not to double the waveform. (Adjust the waveform so that it does not double and has smooth outline. Particularly for the waveform inside the dotted line, set the oscilloscope to 50 mV, 2 μsec for measurement.)</p>

No.	Item	Check Point	Adjustment Parts	Signal	Mode	Description
18	0.25H delayed video signal	VIDEO OUT (75-ohm terminated)	R27 0[4] R163 0[4]	20T pulse	REC (LP) ↓ PB (LP) ↓ STILL	<ol style="list-style-type: none"> 1) Connect the oscilloscope to the VIDEO OUT with 75-ohm terminator. 2) Record the signal and play it back both in the LP mode. 3) Set to the Still mode. Reduce the 0.25H signal level to be 90% approx. by R27. 4) Adjust R163 to maximize the signal level turned down in the step 3). 5) Adjust R27 to coincide the VIDEO OUT signal with that of the 0.25H delayed signal. 6) Confirm no flickering. If observed, repeat the adjustments of the 0.5H delayed video signal and 0.25H delayed video signal.

3.7 PRE/REC CIRCUIT



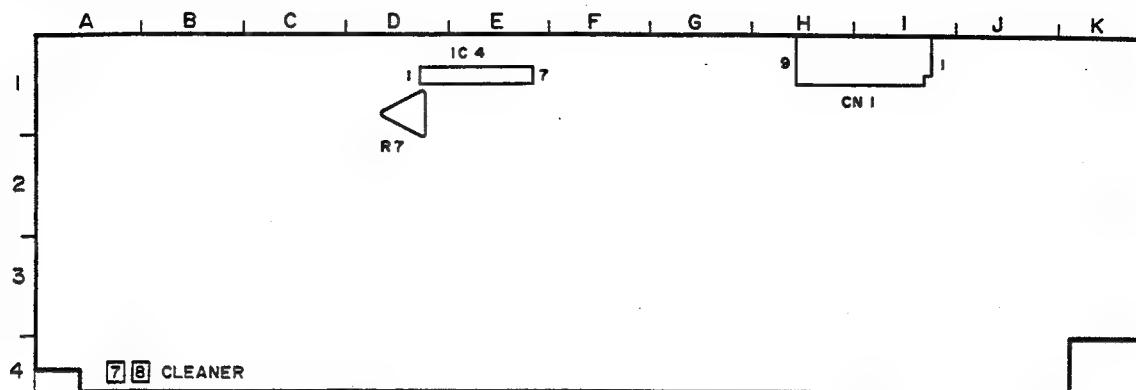
No.	Item	Check Point	Adjustment Parts	Signal	Mode	Description																									
1	Video head resonance & Q (quality factor)	TP4 [4][3] (SP mode) TP3 [4][3] (LP mode)	R18 [4][3] R15 [4][3] R13 [4][3] R12 [4][3]	RF sweeper	EE (SP)	<p>Note:</p> <p>(1) This adjustment is required only after replacing the upper drum (video heads).</p> <p>(2) Connect ground of probe (oscilloscope) to TP1 (GND) of the PRE/REC board.</p> <p>(3) A drum assembly is supported on the deck because of rotation.</p>																									
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Mode & CH</th><th>Direction</th><th>Test point</th><th>VR (Q)</th><th>F_o</th></tr> </thead> <tbody> <tr> <td>SP CH-1</td><td>Hole A side</td><td>TP4</td><td>R18</td><td>C64</td></tr> <tr> <td>SP CH-2</td><td>Hole B side</td><td>TP4</td><td>R15</td><td>C63</td></tr> <tr> <td>LP CH-1</td><td>Hole B side</td><td>TP3</td><td>R13</td><td>C62</td></tr> <tr> <td>LP CH-2</td><td>Hole A side</td><td>TP3</td><td>R12</td><td>C61</td></tr> </tbody> </table>							Mode & CH	Direction	Test point	VR (Q)	F _o	SP CH-1	Hole A side	TP4	R18	C64	SP CH-2	Hole B side	TP4	R15	C63	LP CH-1	Hole B side	TP3	R13	C62	LP CH-2	Hole A side	TP3	R12	C61
Mode & CH	Direction	Test point	VR (Q)	F _o																											
SP CH-1	Hole A side	TP4	R18	C64																											
SP CH-2	Hole B side	TP4	R15	C63																											
LP CH-1	Hole B side	TP3	R13	C62																											
LP CH-2	Hole A side	TP3	R12	C61																											
<p style="text-align: center;">F_o : 5.5 MHz</p> <p>SP a : b = 1 : 2 (LP a : b = 3 : 5)</p> <p style="text-align: center;">COAXIAL cable less than 1 m</p> <p>PTU94004A (ADJUST Coil)</p> <p>to Sweep Generator with approx 640 mVp-p signal</p> <p>DRUM ASS'Y of Video cassette</p>																															
<ol style="list-style-type: none"> 1) Insert a VHS tape and set for the EE mode (VHS-SP mode). 2) Connect an oscilloscope to TP4 of the PRE/REC board. Supply a sweeper generator output to adjustment jig as shown in the figure, then adjust the sweeper generator gain so that the waveform does not distort at TP4. 3) Trigger the oscilloscope externally with the signal from trigger output (VD) of the sweeper generator. 4) Use the control of the oscilloscope to position the 1 MHz region at graduation 3 of the oscilloscope. 5) Adjust R11, C64 to position the 5.5 MHz portion at 6 of the oscilloscope graduation as shown in the figure. 6) In the same manner, adjust R15, C63 for CH-2 (SP). To change CH-1 and CH-2 of the drum assy with each other, repeat Play and Stop operations to switch the drum FF since it activates CH-1 or CH-2 according to the timing. 7) Connect the oscilloscope's probe to TP3, and adjust R13, C62 (LP CH-1) and R12, C61 (LP CH-2) for the LP mode in the same manner as the above steps 1) through 6) for the SP mode. <p>Note: In the quality factor adjustment in the condition that a : b = 3 : 6, if there occurs inversion, etc., change the condition so that a : b = 3 : 5 and do the adjustment again.</p>																															

3.8 TDG/TIMER CIRCUIT

No.	Item	Check Point	Adjustment Parts	Signal	Mode	Description
1	On-Screen position	VIDEO OUT ↓ TV monitor	C6 7 4	Color bar	E-E	<ol style="list-style-type: none"> 1) Connect the TV monitor to the VIDEO OUT terminal. 2) Set the ON SCREEN switch on the front panel to ON. 3) Move the on screen display to the rightmost position in the screen while pressing the ON SCREEN POSITION switch on the front panel. 4) Adjust C6 to position colon between the hour and minute indications on the boundary line between red and magenta of the color bars while observing the TV monitor. 5) While turning the ON SCREEN BRIGHTNESS control on the front panel, confirm that the brightness of the display changes as the VR is turned. <p>After the confirmation, make sure to reset the BRIGHTNESS VR to the center position.</p>
2	TDG clock adjustment	TP4 7 9 ↓ Frequency counter	C12 7 9	—	E-E	<ol style="list-style-type: none"> 1) Disconnect the AC plug from the outlet. 2) Externally supply 5 V DC to the plus (+) terminal (upper left) of the battery case with grounding to its minus (−) terminal (lower right). 3) Shortcircuit between TP1 and GND with the shorting lead shown below. <div style="text-align: center;">  </div> <ol style="list-style-type: none"> 4) Shortcircuit between wire of TP2 and GND with the shorting lead to reset the time. 5) Adjust C12 to obtain a frequency of 2048.000 ± 0.001 Hz at TP2. (Cycle check $488.2 \mu s$).

3.9 CLEANER CIRCUIT

• CLEANER board (Parts side)



R	7
Location	D1

IC	4
Location	E1

CN	1
Location	I 1

No.	Item	Check Point	Adjustment Parts	Signal	Mode	Description
1	Solenoid drive time adjustment	IC4 pin 6	R7	—	PLAY/STOP	<p>1) Connect an oscilloscope to pin 6 of IC4 and adjust R7 so that pulse width "a" becomes 1.0–1.2 sec as shown in the figure.</p>

SECTION 4

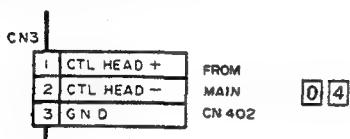
DIAGRAMS AND CIRCUIT BOARDS

■ FOREWORD

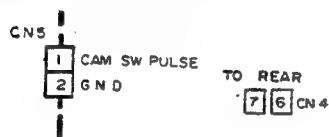
1. Expression of connector

Connector is expressed in the two ways.

- 1) The following illustrates "CN3 pins 1, 2 and 3".



- 2) The following illustrates "CN5 pins 1 and 2".



2. Expression of wiring

As the following circuit diagram is divided to print on some sheets, such an indication as the following is found in the case the wiring extends over two or more divided sections.

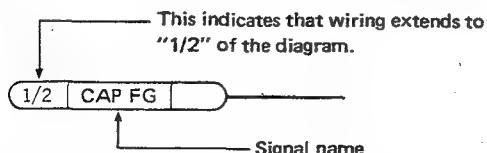
- 1) Circuit diagram divided into two or more sections:

Board No.	Board Name	Circuit Name
04	MAIN	Y Section COLOR Section AUDIO Section
06	TIME LAPSE SERVO	1/2 Section 2/2 Section
07	MECHACON	2/1 Section 2/2 Section 2/1 Section 2/2 Section
43	PRE/REC	

- 2) Indication of wiring which extends to another section:

(Example)

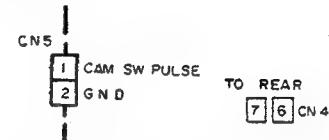
On the "2/2" diagram of MECHACON board, such a indication as the following is found on the CAP FG signal line.



In the above case, the end of the wiring is connected to the "1/2-CAP FG" on the 1st section of the diagram.

3. Wiring of connector

(Example)



In the above example, CN5 is connected with CN4 on 7 6 REAR board.

4. Signal flow on the diagram

The following arrow marks indicate the specified signal paths respectively.

- : RECORDING or EE SIGNAL PATH
- : PLAY BACK SIGNAL PATH
- : REC/PLAY SIGNAL PATH

5. Measurement of voltage and waveform

Voltage : Measured by digital voltmeter in REC mode. Where voltages differ between recording and playback, the voltage during playback is shown in parentheses.

Waveform : Waveforms (VIDEO System) are measured with a color bar during recording and playback. Waveforms (AUDIO System) are measured with 1 kHz (-8 dBs) during recording and playback.

6. Unit of value

Unless otherwise specified:

- Resistance is in Ω (1/6 W)
- Capacitance in μF .
- Inductance in μH .
- Diodes are 1SS133.
- Screened parts (in) are important for safety assurance. When replacing them, use specified parts.

4.1 KEY TO ABBREVIATIONS

A	ACC	: Automatic Color Control
	ADD	: Adder
	ADC	: Analog to Digital Converter
	ADJ	: Adjustment
	A DUB	: Audio Dubbing
	AE	: Audio Erase
	AEF	: Automatic Edition Function
	AFC	: Automatic Frequency Control
	AFT	: Automatic Fine Tuning
	AGC	: Automatic Gain Control
	AH	: Audio Head
	AL	: After Loading
	ALC	: Automatic Level Control
	ALM	: Alarm
	AM	: Amplitude Modulation
	AMP	: Amplifier
	ANT	: Antenna
	APC	: Automatic Phase Control
	APL	: Average Picture Level
	ASSEM	: Assembly
	ASS'Y	: Assembly
	ATT	: Attenuator
	AUTO	: Automatic
	AUX	: Auxiliary
	AUD	: Audio

B	B	: Brake
	BAL	: Balance
	BATT	: Battery
	BCD	: Binary Coded Decimal
	BEG	: Beginning
	BFP	: Burst Flag Pulse
	BIT	: Binary Digit
	BLK	: Black
	BLU	: Blue
	BNC	: Bayonet connector
	BPF	: Bandpass Filter
	BRN	: Brown
	BRT	: Brightness
	B. SOL	: Brake Solenoid
	B/W	: Black and White

C	C	: Ceramic
	CAP	: Capstan
	CASS	: Cassette
	CF	: Ceramic Filter, color Frame
	CC	: Cassette compartment
	CE	: Chip Enable
	CH	: Channel
	CHROMA	: Chrominance
	CLK	: Clock
	CLR	: Clear
	CMD	: Command
	CNT	: Count, Counter
	CONV	: Converter
	COL	: Color
	COM	: Common
	COMP	: Comparator
		: Composite
		: Compensation
	CONN	: Connector
	CT	: Ceramic Trap
	CTC	: Crosstalk Cancel
	CTL	: Control

D	D	: Drum
	DAC	: Digital to Analog Converter
	DD	: Direct Drive
	DEC	: Decoder
	DEMOD	: Demodulator
	DET	: Detector
	DEV	: Deviation
	DFRS	: Drum Free RUN STOP
	DIF TRANS	: Differential Transformer
	DISCR	: Discriminator
	DL	: Delay Line
	DOC	: Dropout Compensator
	DRUM FF	: Drum Flip Flop
	DUB	: Dubbing

E	E	: Edit, Erase
	EDP	: Electronic Data Processing
	E-E	: Electric to Electric
	EF	: Emitter-Follower
	EMPHA	: Emphasis
	EMG	: Emergency
	ENC	: Encoder
	EN	: Enable
	EQ	: Equalizer
	ESNS	: End Sensor
	EXP	: Expander
	EXT	: External

F	FE	: Full Erase
	FF	: Fast Forward
		: Flipflop
	FG	: Frequency Generator
	FM	: Frequency Modulation
	FMA	: FM Audio
	FREQ	: Frequency
	F-V CONV	: Frequency to Voltage Converter
	FWD	: Forward

G	GDL	: Grass Delay Line
	GEN LOCK	: Generator Lock
	GND	: Ground
	GRN	: Green
	GRY	: Gray

H	H	: High, Horizontal
	HG	: Hall Generator
	HPF	: Highpass Filter

I	IF	: Intermediate Frequency
	IFT	: Intermediate Frequency Transformer
	IND	: Indicator
	INH	: Inhibit
	INS	: Insert
	INT	: Internal, Interrupt
	INV	: Inverter
	I/O	: Input/Output

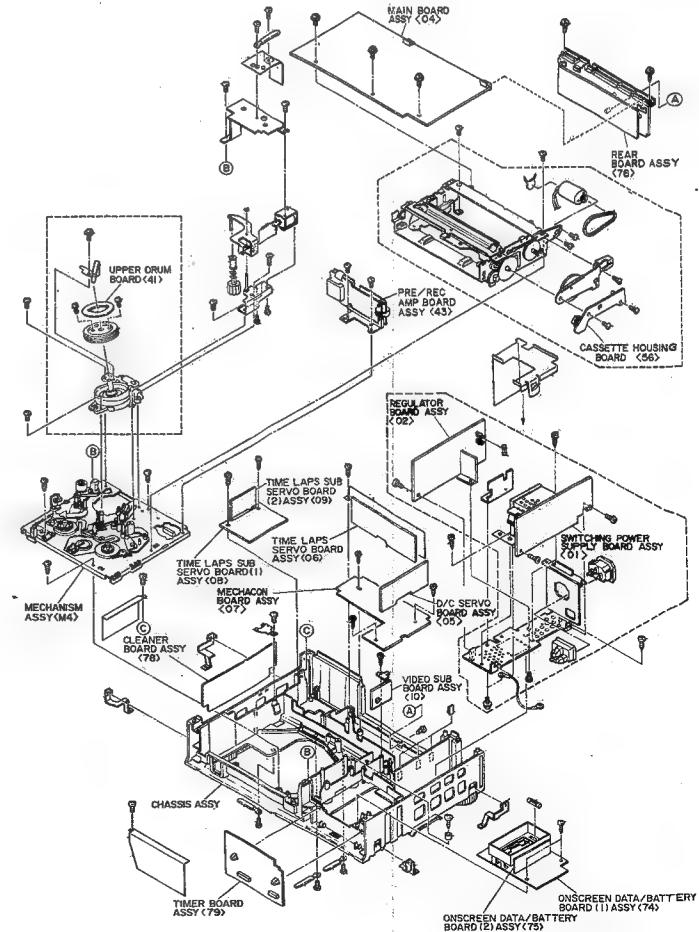
L	L	: Low
	LB	: Low Band
	LCD	: Liquid Crystal Display
	LE	: Loading End
	LED	: Light Emitting Diode
	LIN	: Linearity
	LIM	: Limiter
	LOAD	: Loading
	LP	: Long Play

4.2 CIRCUIT BOARD LOCATIONS

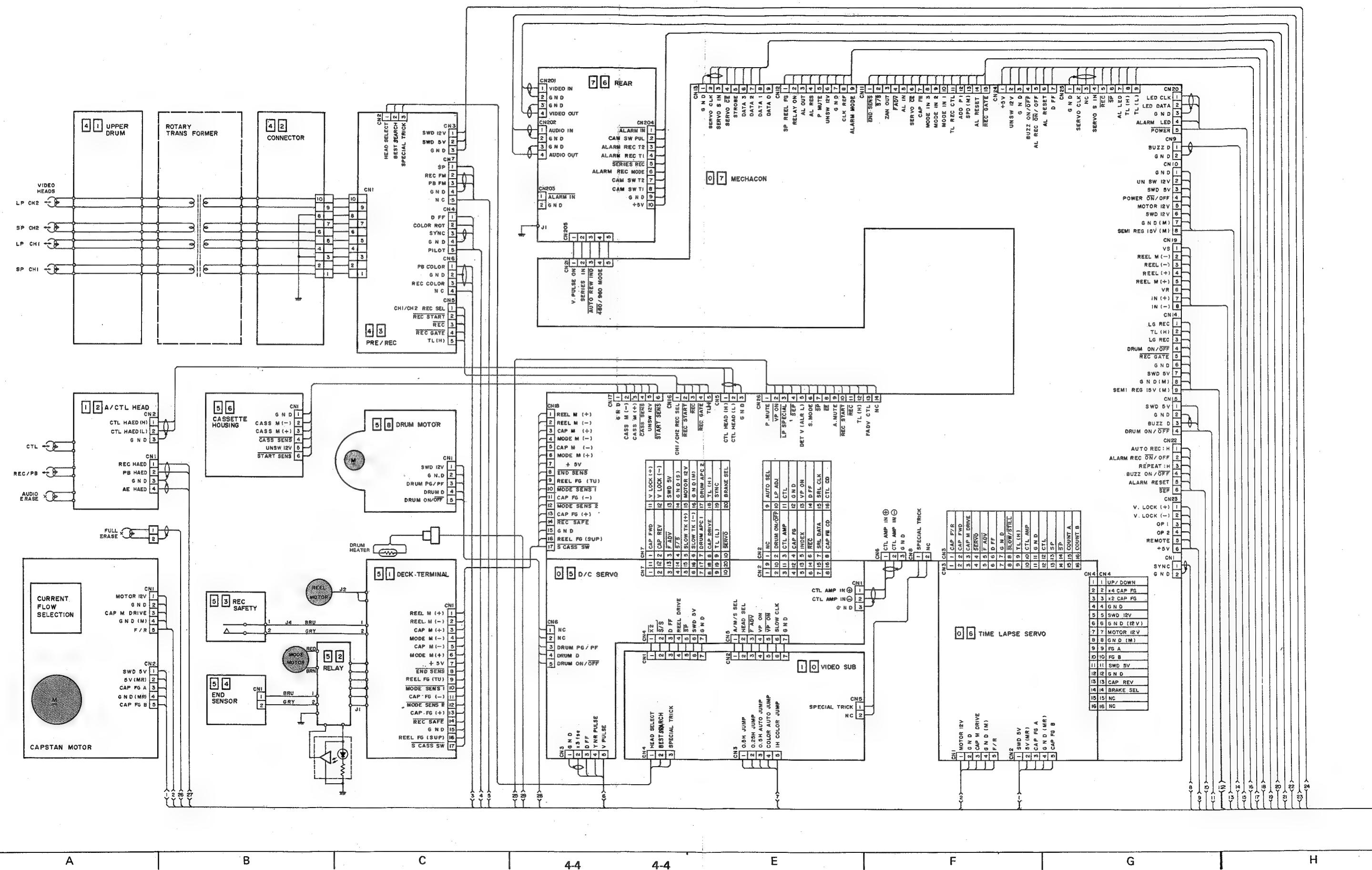
LPF	: Lowpass Filter
LT	: Loading Tension
M	
MAX	: Maximum
MDA	: Motor Drive Amplifier
MIC	: Microphone
MIN	: Minimum
MIX	: Mixer
MM	: Monostable Multivibrator
MOD	: Modulator
MON	: Monitor
MOS	: Metal Oxide Semkonductor
MPX	: Multiplexer
MS	: Mode Select
MUT	: Muting
N	
NC	: Noise Cancel
NFB	: Negative Feedback
NO	: Normally Open
O	
OPAMP	: Operational Amplifier
OP	: Operation
ORN	: Orange
OSC	: Oscillator
P	
PB	: Playback
PC	: Photocoupler
PCM	: Pulse Code Modulation
PGM	: Program
PG	: Pulse Generator
PI	: Photo Interrupter
PLL	: Phase Locked Loop
POS	: Position
PR	: Pinch Roller
PREV	: Preview
PRL	: Preroll
PU	: Pickup
PWB	: Printed Wiring Board
Q	
Q	: Quality Factor
R	
RA	: Resistor Array
RAM	: Random Access
REC	: Random Access Memory
REG	: Recording
REV	: Regulated
REW	: Reverse
RF	: Rewind
RST	: Radio Frequency
R/P	: Reset
RPT	: Record/Playback
RT	: Repeat
RY	: Rotary Transformer
S	
S	: Search, Servo
SC	: Subcarrier
SEAR	: Search
SEL	: Select
SENS	: Sensor
SEP	: Separator
SF	: Source Follower
SFF	: Short Fast Forward
SFWD	: Search Forward
SI	: Serial In
SIG	: Signal
SO	: Serial Out
SOL	: Solenoid
SOS	: Sound on Sound
SP	: Standard Play
SR	: Supply Reel
SREV	: Search Reverse
SREW	: Short Rewind
SSG	: Sync Signal Generator
STL	: Still
SUP	: Supply
SYNC	: Synchronization
SYSCON	: System control
T	
TBC	: Time Base Corrector
TC	: Tension Control, Time Code
TDG	: Time Date Generator
T.EALM	: Tape End Alarm
TEN	: Tension
TIM	: Timing
TK	: Tracking
TL	: Time Lapse
TREC	: Timer Record
TSW	: Time Switch
TU	: Take-up
TUR	: Take-up Reel
U	
UNLD	: Unloading
UNREG	: Unregulated
UNSW	: Unswitched
V	
V	: Video, Vertical
VCO	: Voltage Controlled Oscillator
VD	: Vertical Drive
VXO	: Variable Crystal Oscillator
VLT	: Violet
VSCH	: Variable Search
W	
WHT	: White
WV	: Working Voltage
WARN	: Warning
X	
XTL	: Crystal
Y	
Y	: Luminance
YLW	: Yellow

Index to board by kind of diagrams

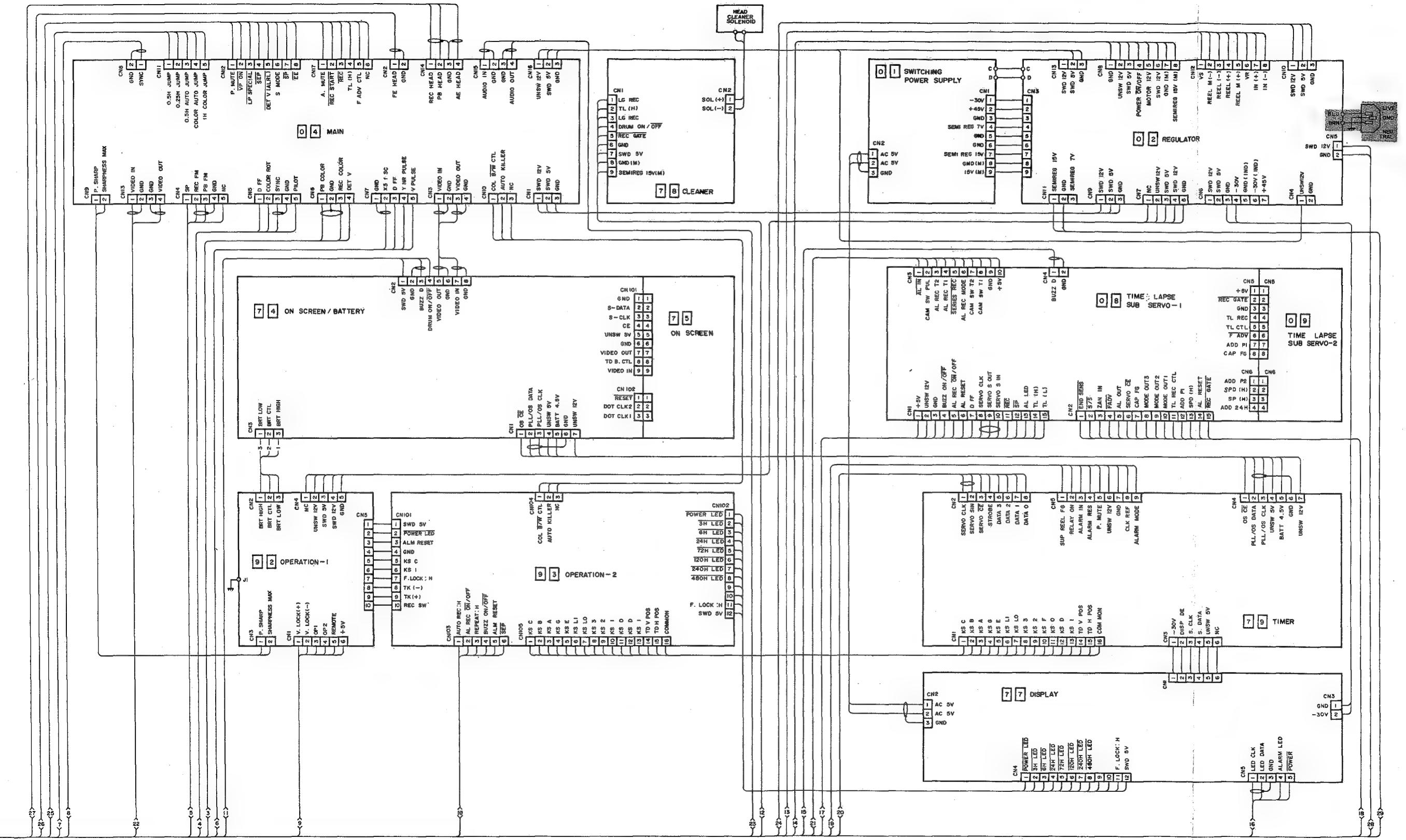
Board No.	Board Name	Page of Diagram		
		Block diagram	Schematic diagram	Circuit board
01	SWITCHING P.S	—	4-12	4-13
02	REGULATOR	—	4-12	4-13
04	MAIN <VIDEO Y SECTION> <VIDEO C SECTION>	4-6 4-6	4-14 4-15	4-17 4-17
05	<AUDIO SECTION>	4-7	4-16	4-17
06	D/C SERVO	4-9	4-18	4-19
07	TIME LAPSE SERVO	4-8	4-23, 24	4-22
08	MECHAON	4-10	4-25, 26	4-27
	TIME LAPSE SUB SERVO (1)	—	4-20	4-21
09	TIME LAPSE SUB SERVO (2)	—	4-20	4-21
10	VIDEO SUB	4-9	4-28	4-28
12	A/C HEAD	4-7	—	6-20
41	UPPER DRUM	4-11	4-4	—
43	VIDEO PRE/REC	4-11	4-30, 31	4-31
51	DECK TERMINAL	4-10	4-43	4-42
52	RELAY	4-10	4-43	4-42
53	REC SAFETY	4-10	4-43	4-42
54	END SENSOR	4-10	4-43	4-42
56	CASSETTE HOUSING	4-10	4-43	4-42
74	ON SCREEN DATA/BATTERY (1)	—	4-32	6-22
75	ON SCREEN DATA/BATTERY (2)	—	4-32	6-23
76	REAR	—	4-29	6-23
77	DISPLAY	—	4-34	6-23
78	CLEANER	—	4-36	6-24
79	TIMER	—	4-38	6-24
92	OPERATION 1	—	4-40	6-25
93	OPERATION 2	—	4-40	6-26



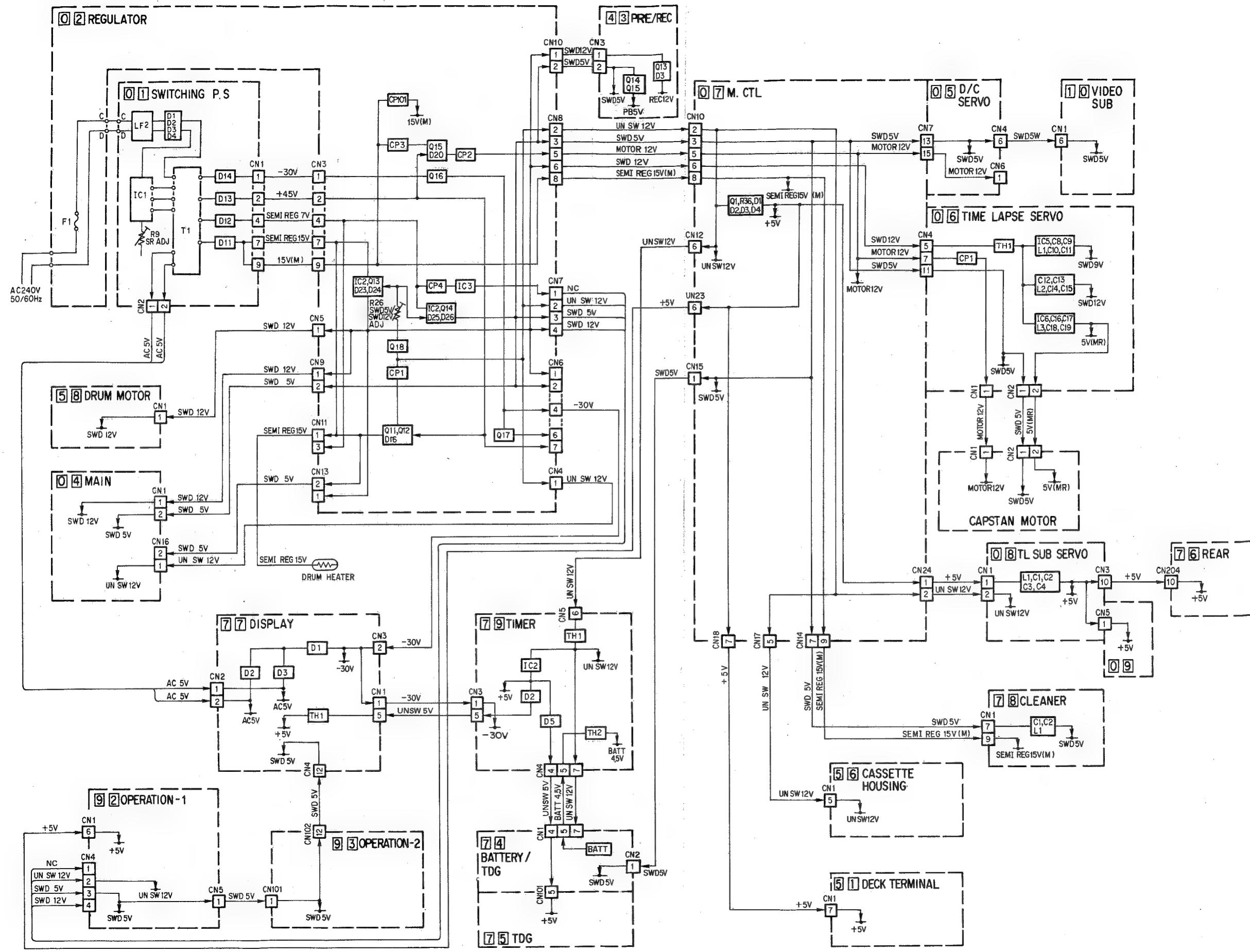
4.3 OVERALL WIRING DIAGRAM (1/2)



OVERALL WIRING DIAGRAM (2/2)



4.4 POWER SYSTEM BLOCK DIAGRAM



A B C 4-6 4-6 E F G H

4.5 MAIN (VIDEO) BLOCK DIAGRAMS

6

5

4

3

2

1

A

B

C

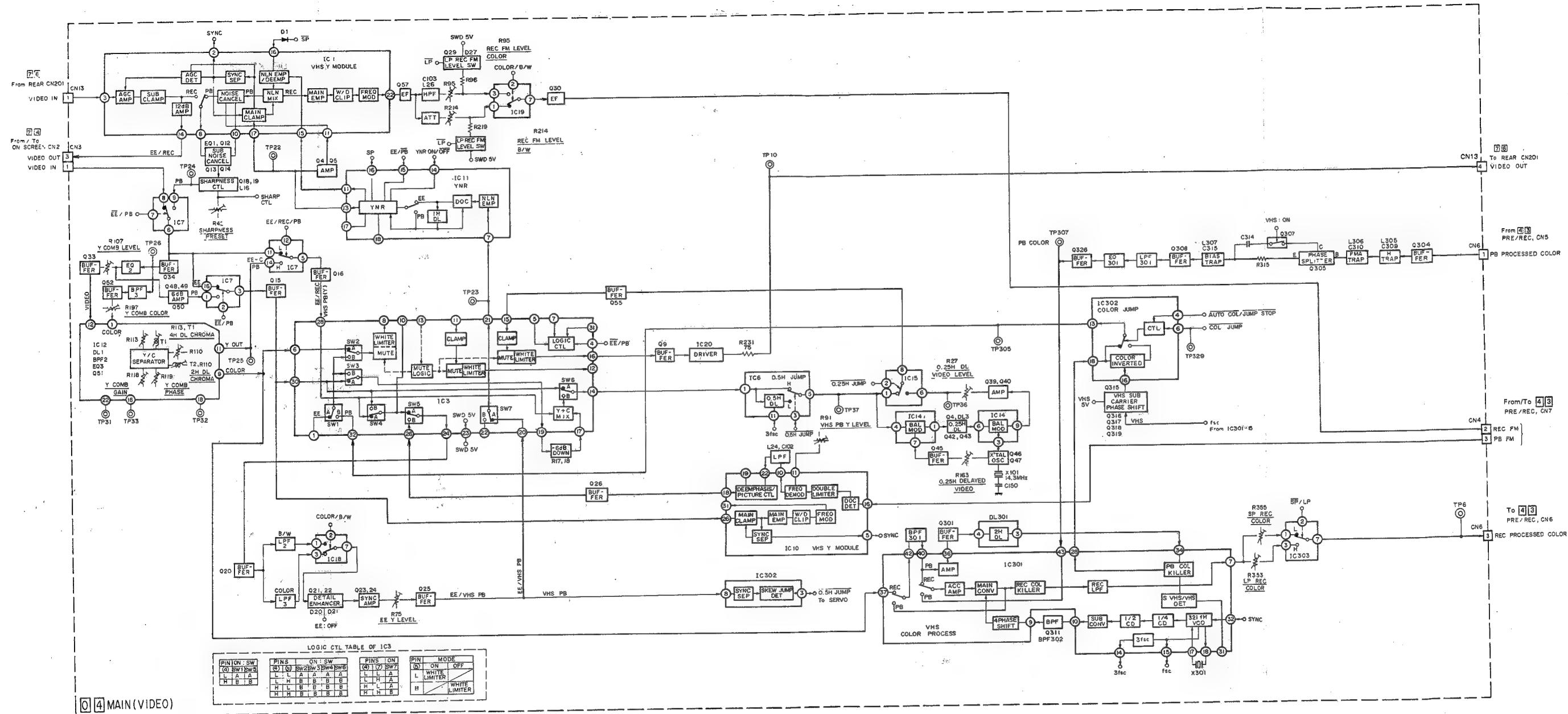
D

E

F

G

H



4-7

4-7

E

F

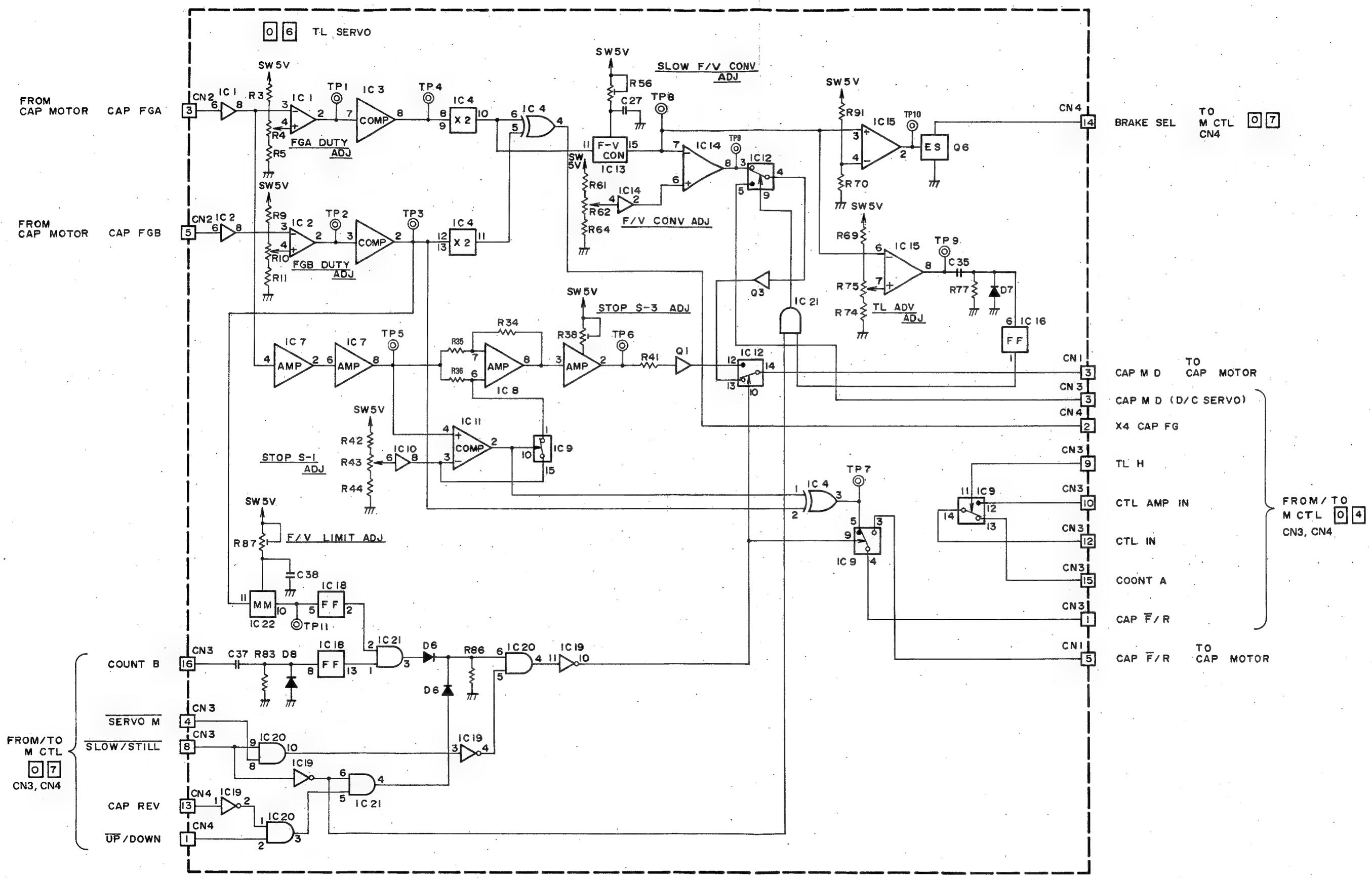
G

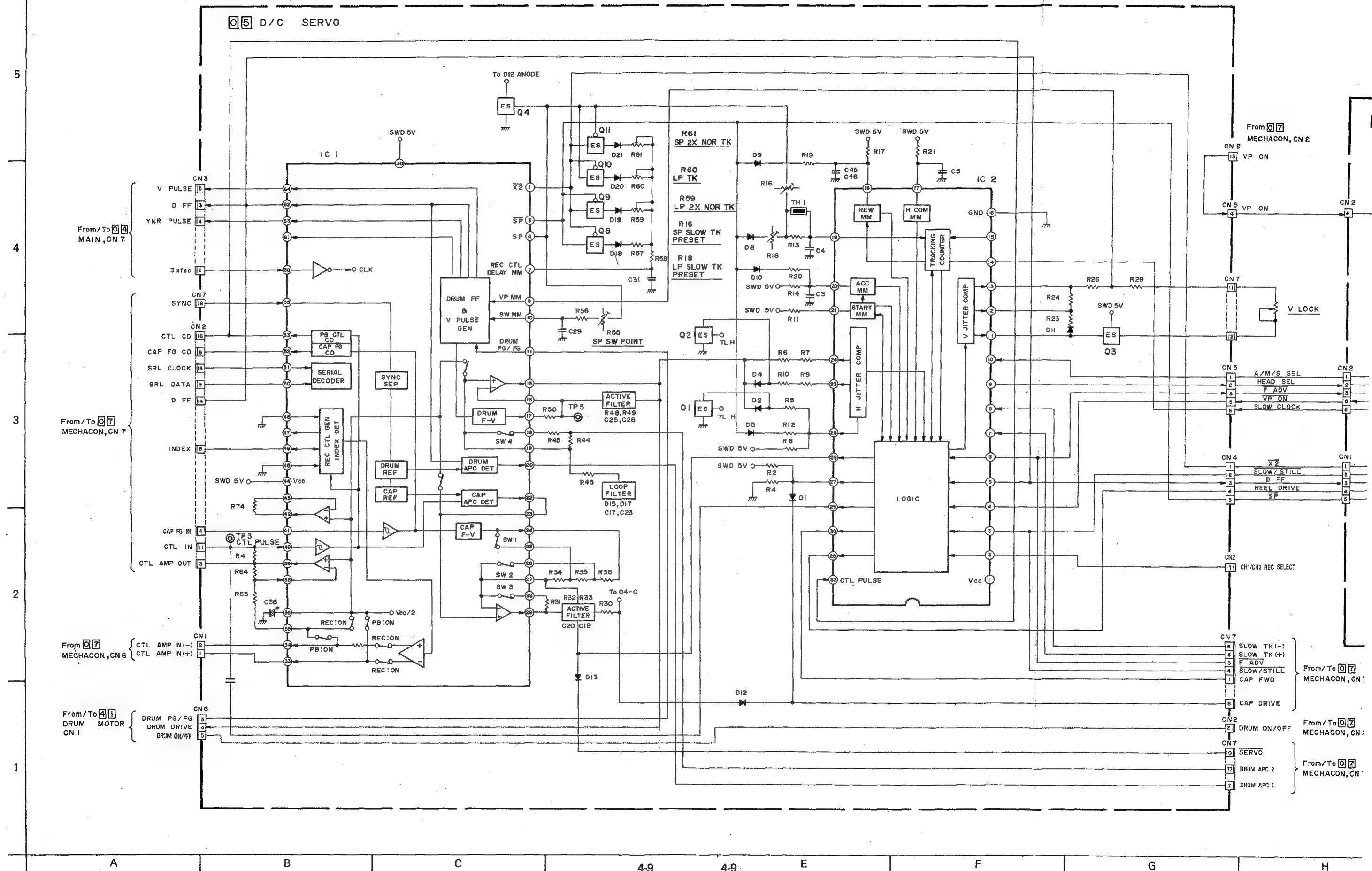
H

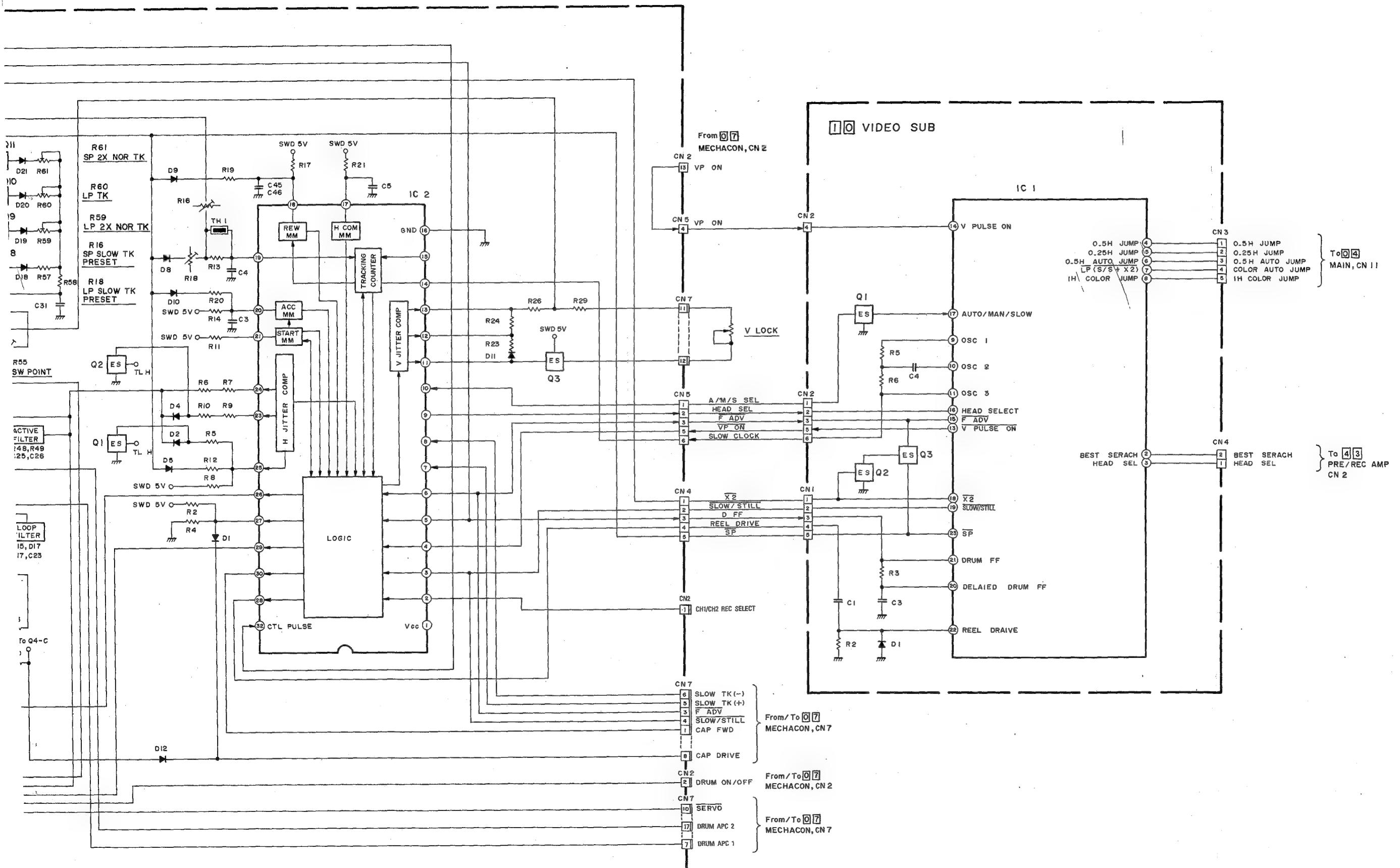
④ MAIN (VIDEO)

LOGIC CTL TABLE OF IC3			
PIN	ON: SW	PIN	ON: SW
(0)	SW1SW5	(0)	SW1SW5
(1)	SW2SW3SW4SW6	(1)	SW2SW3SW4SW6
(2)	L L H A	(2)	L L H A
(3)	L L H B	(3)	L L H B
(4)	H L H A	(4)	H L H A
(5)	H L H B	(5)	H L H B
(6)	H H B B	(6)	H H B B
(7)	H H B B	(7)	H H B B

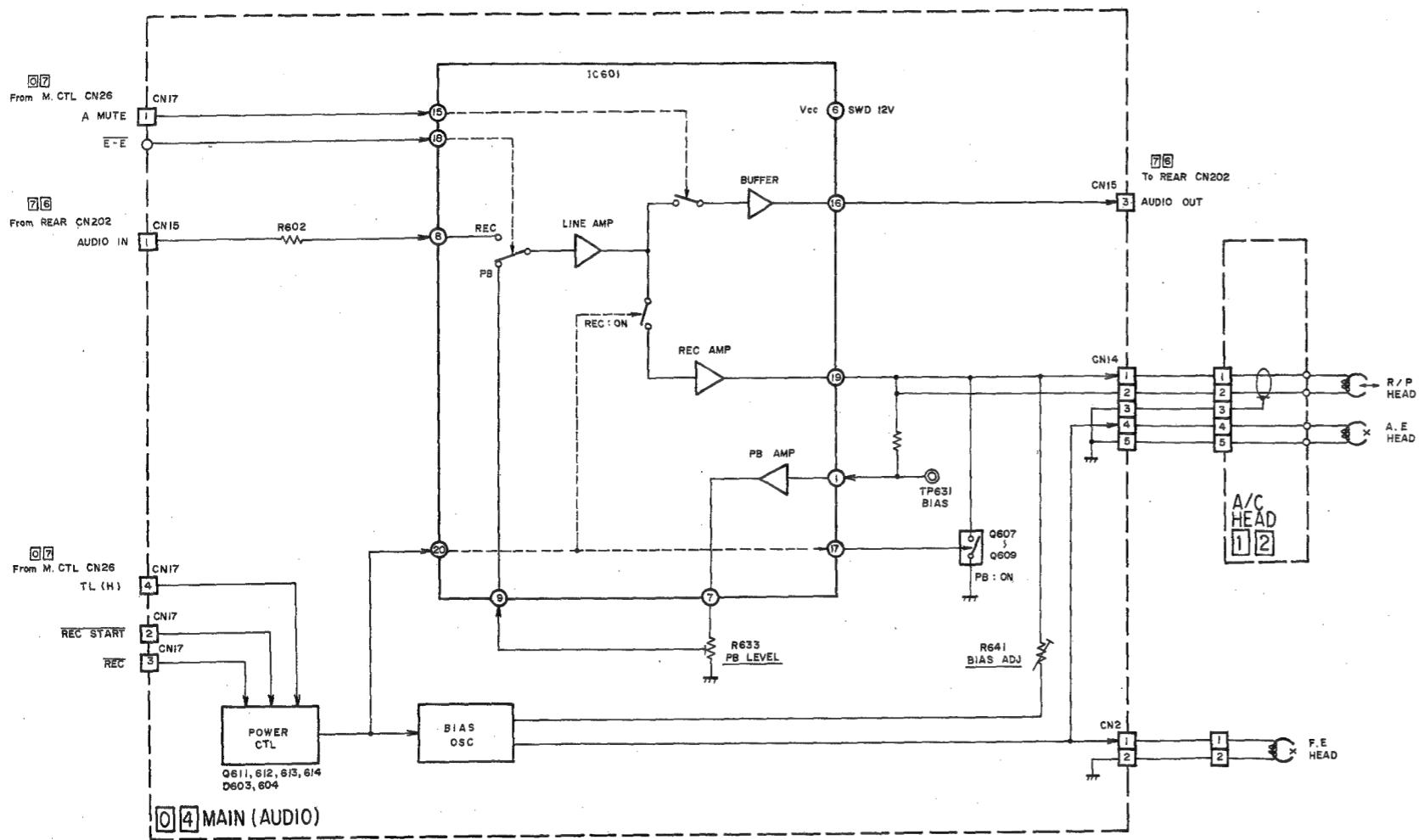
4.6 SERVO BLOCK DIAGRAM (1/2)







4.7 MAIN (AUDIO) BLOCK DIAGRAM



4-10

A

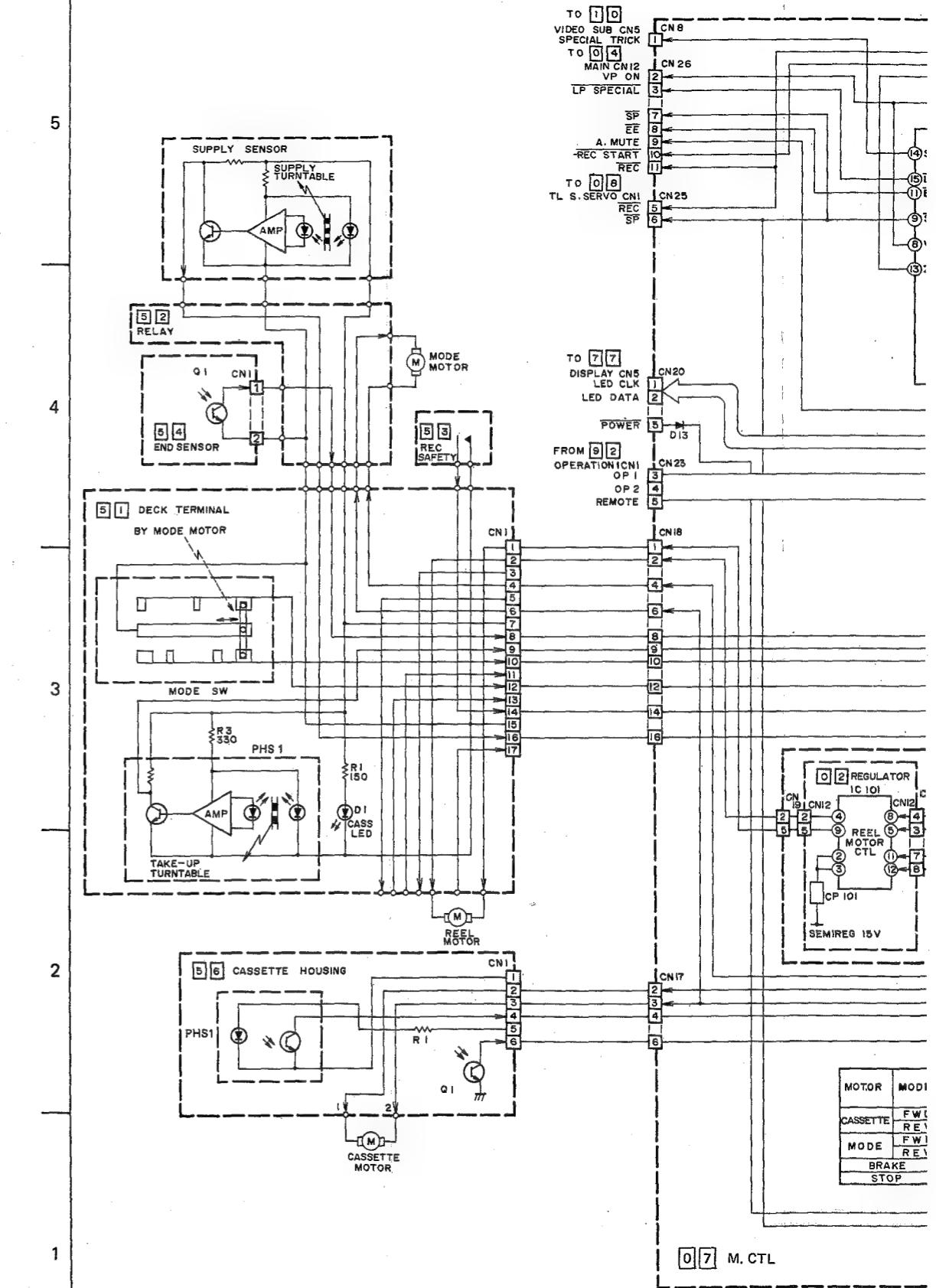
B

C

D

E

4.8 MECHA CON BLOCK DIAGRAM



4-10

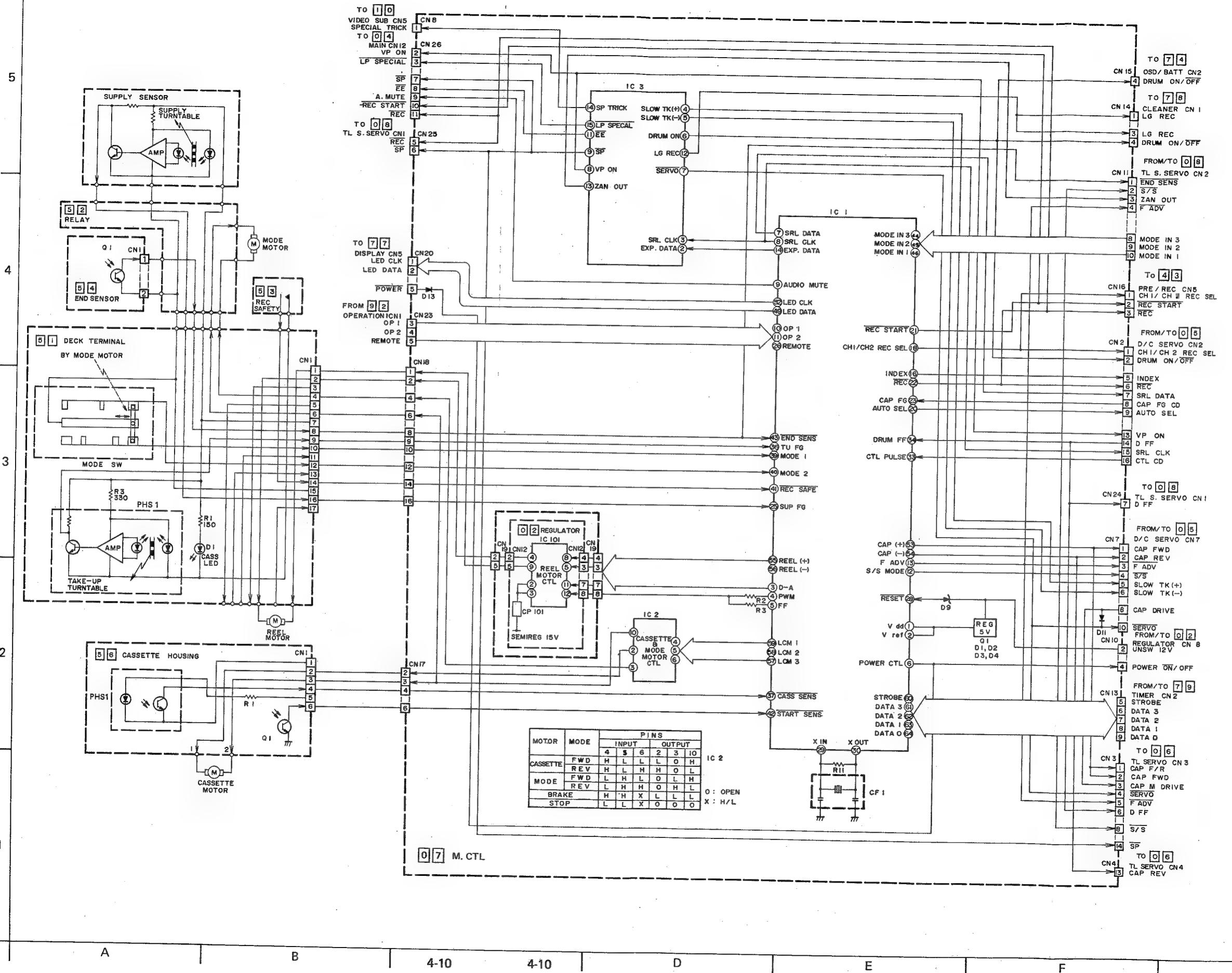
A

B

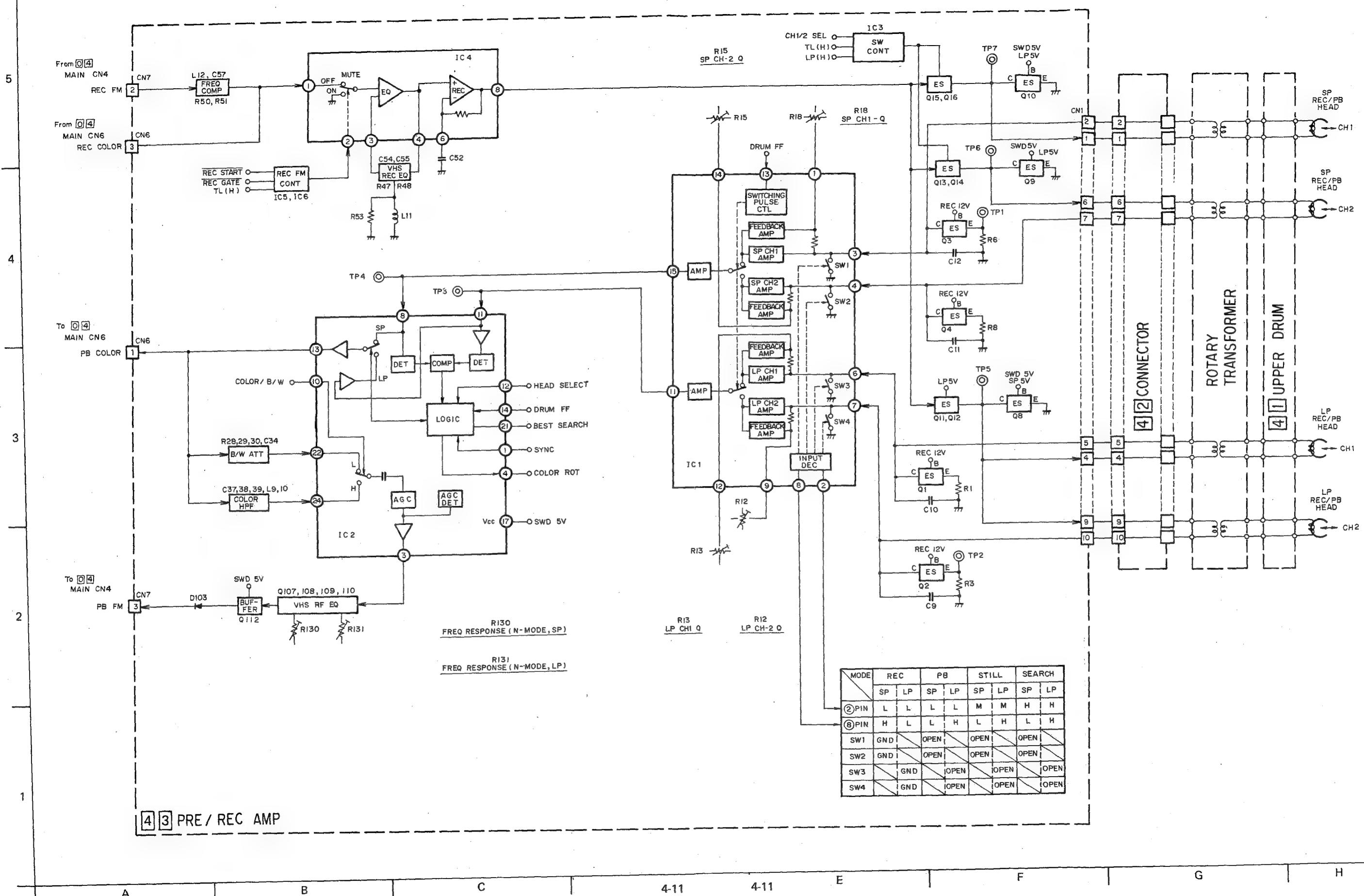
4-10

4-10

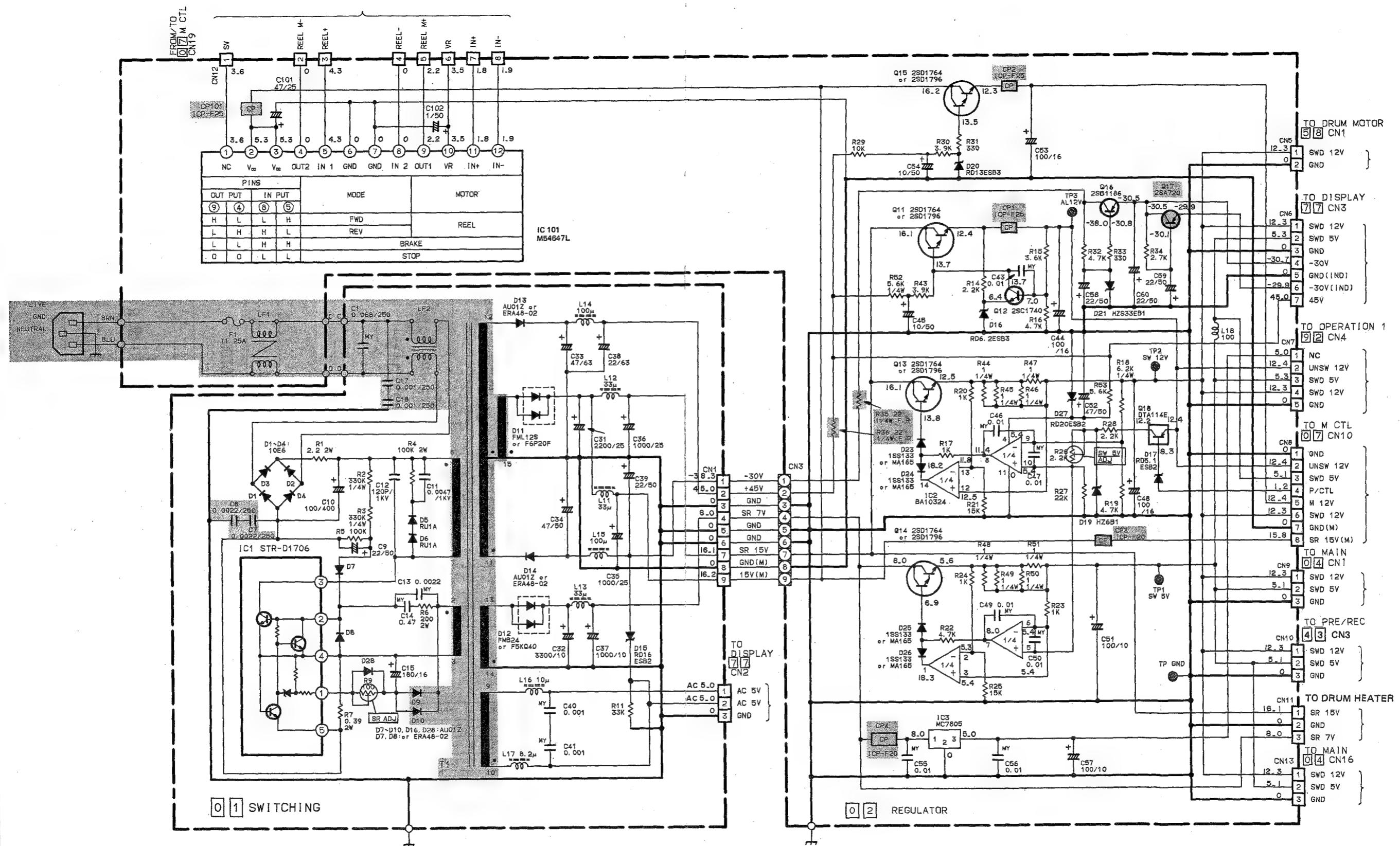
07 M. CTL



4.9 VIDEO PRE/REC BLOCK DIAGRAM

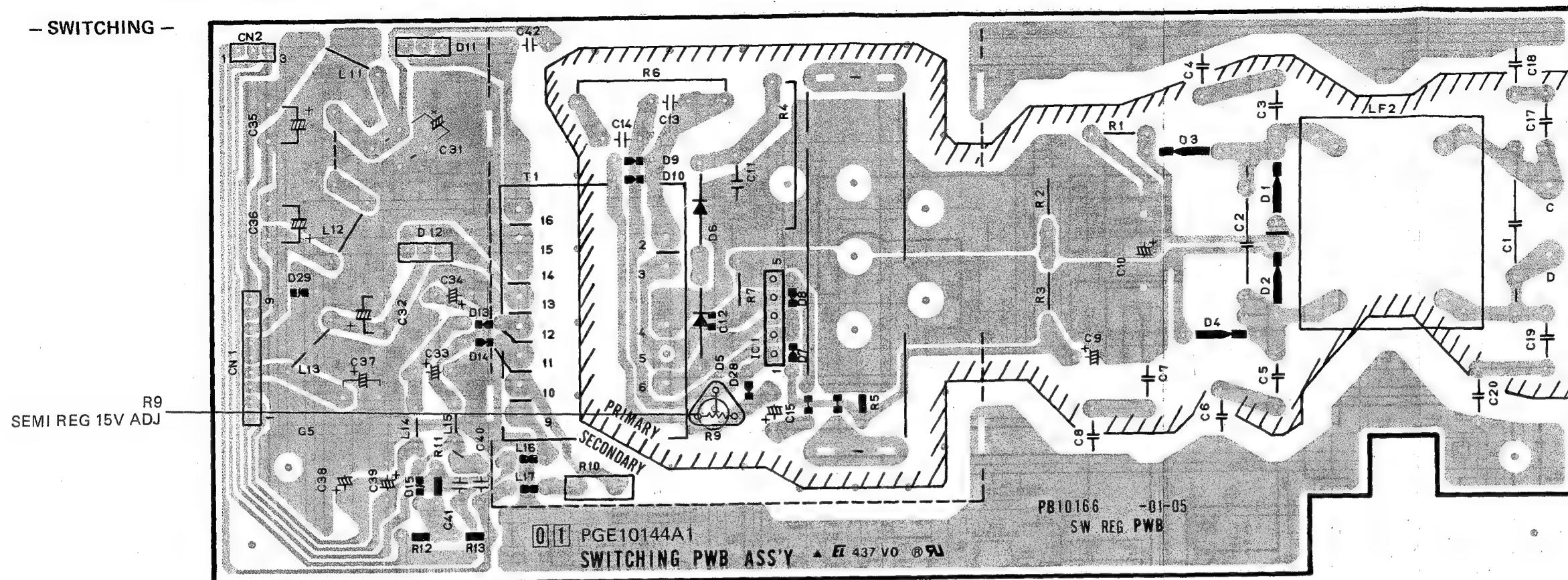


4.10 POWER SUPPLY SCHEMATIC DIAGRAM

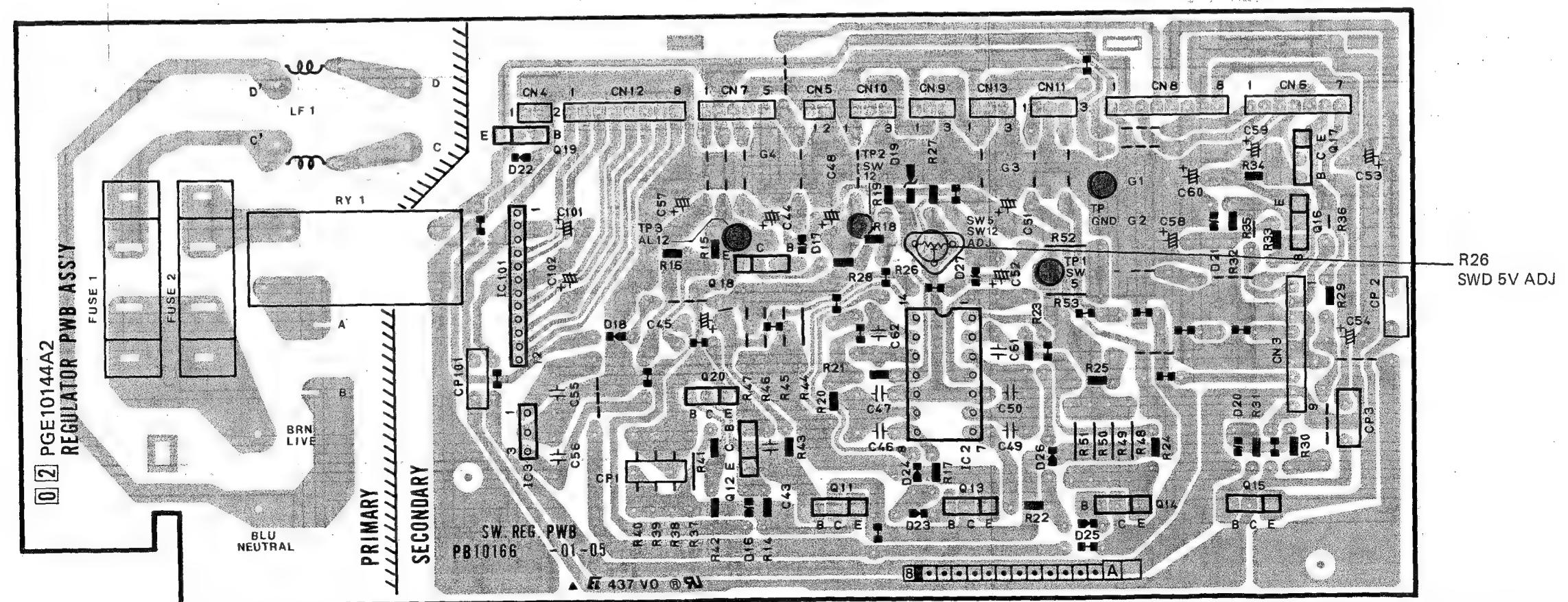


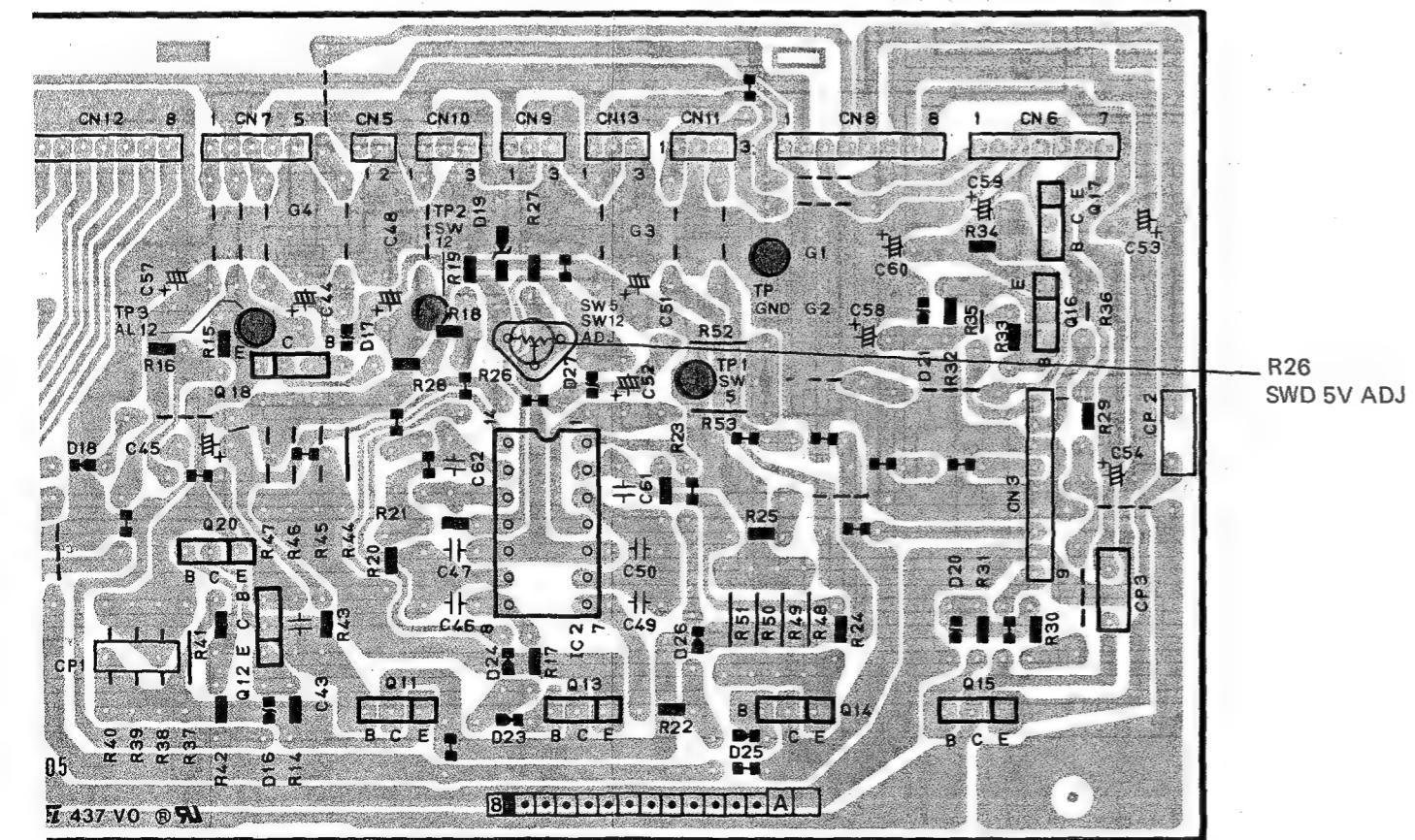
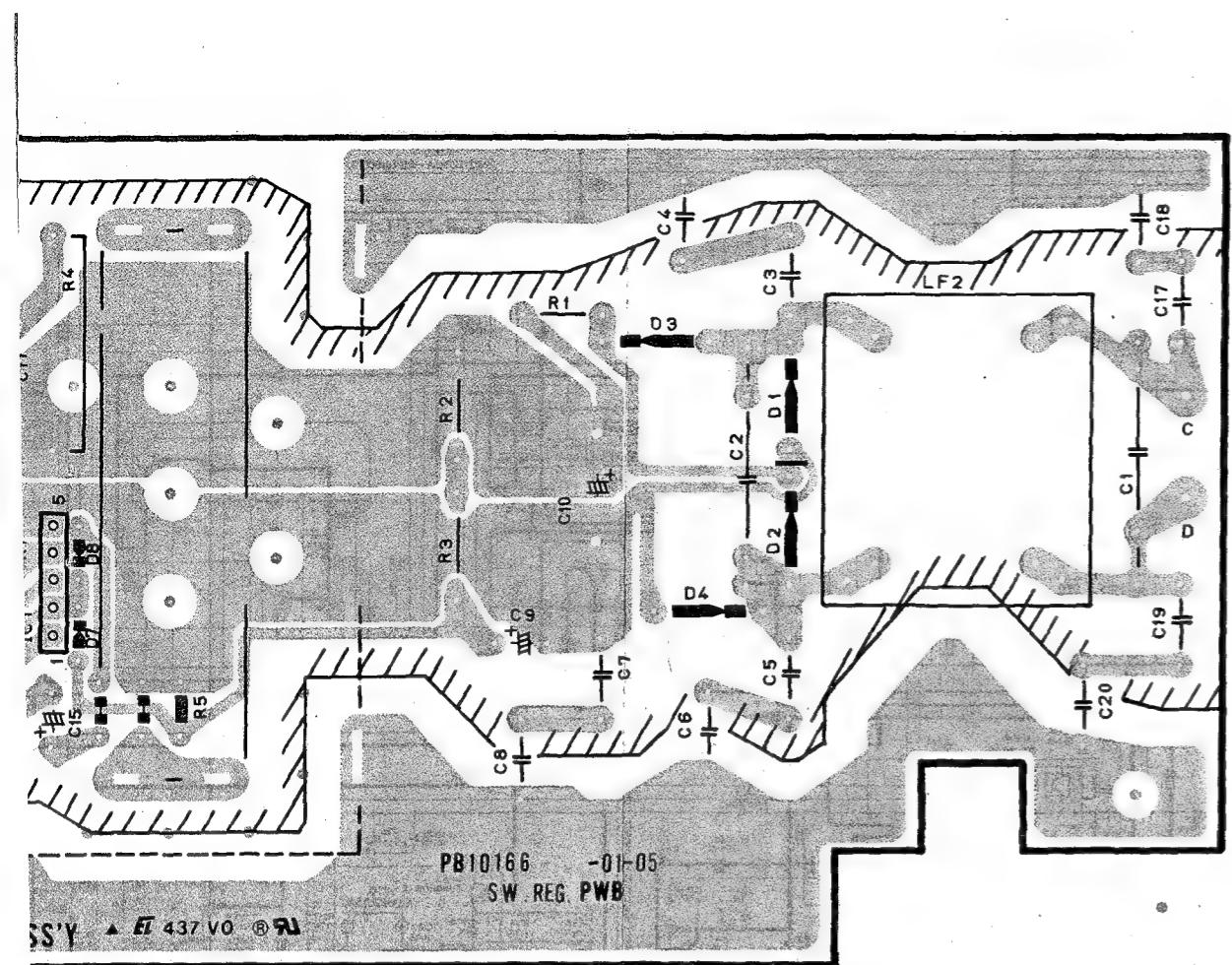
4.11 POWER TRANS CIRCUIT BOARD

— SWITCHING —



— REGULATOR —

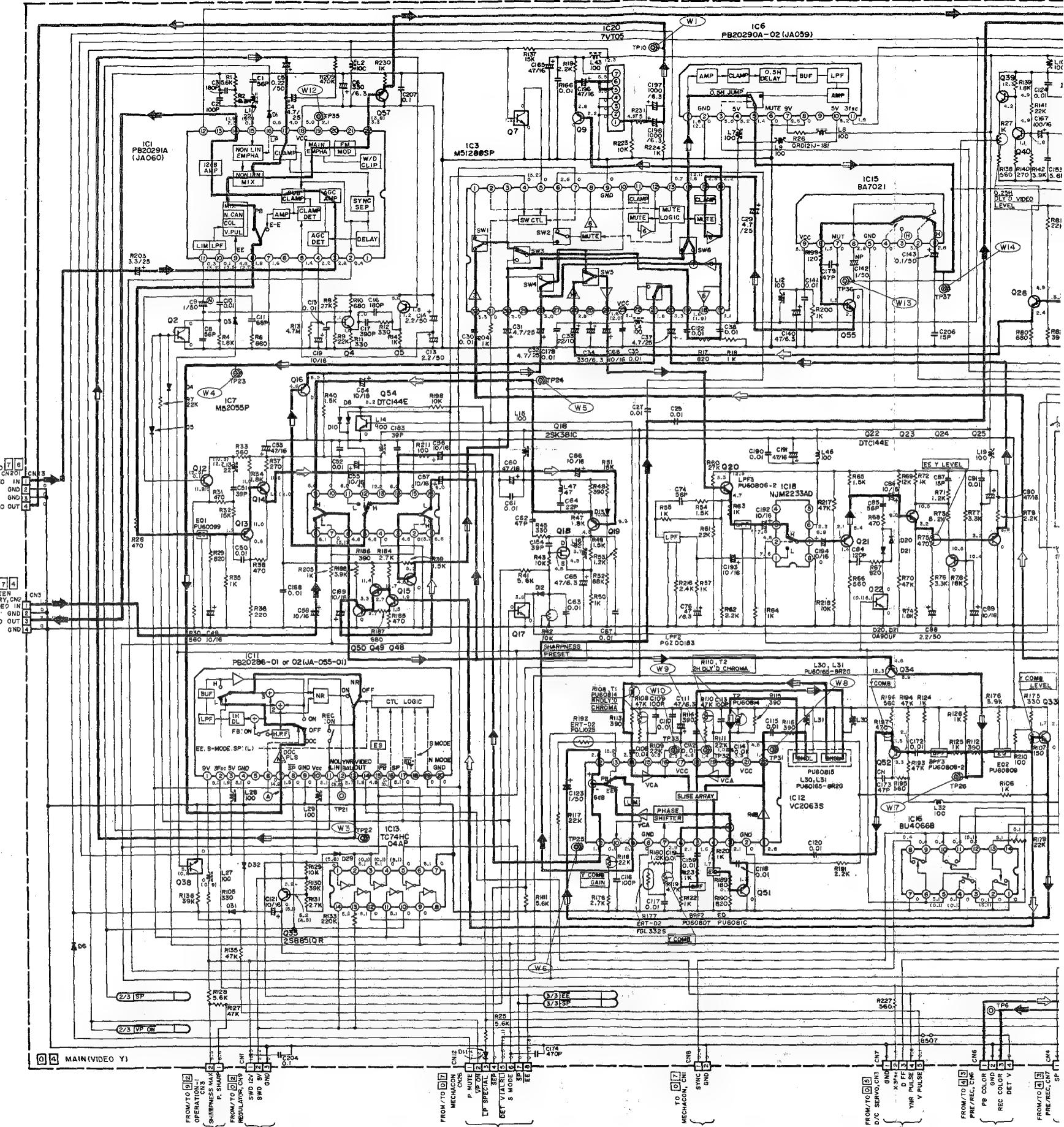
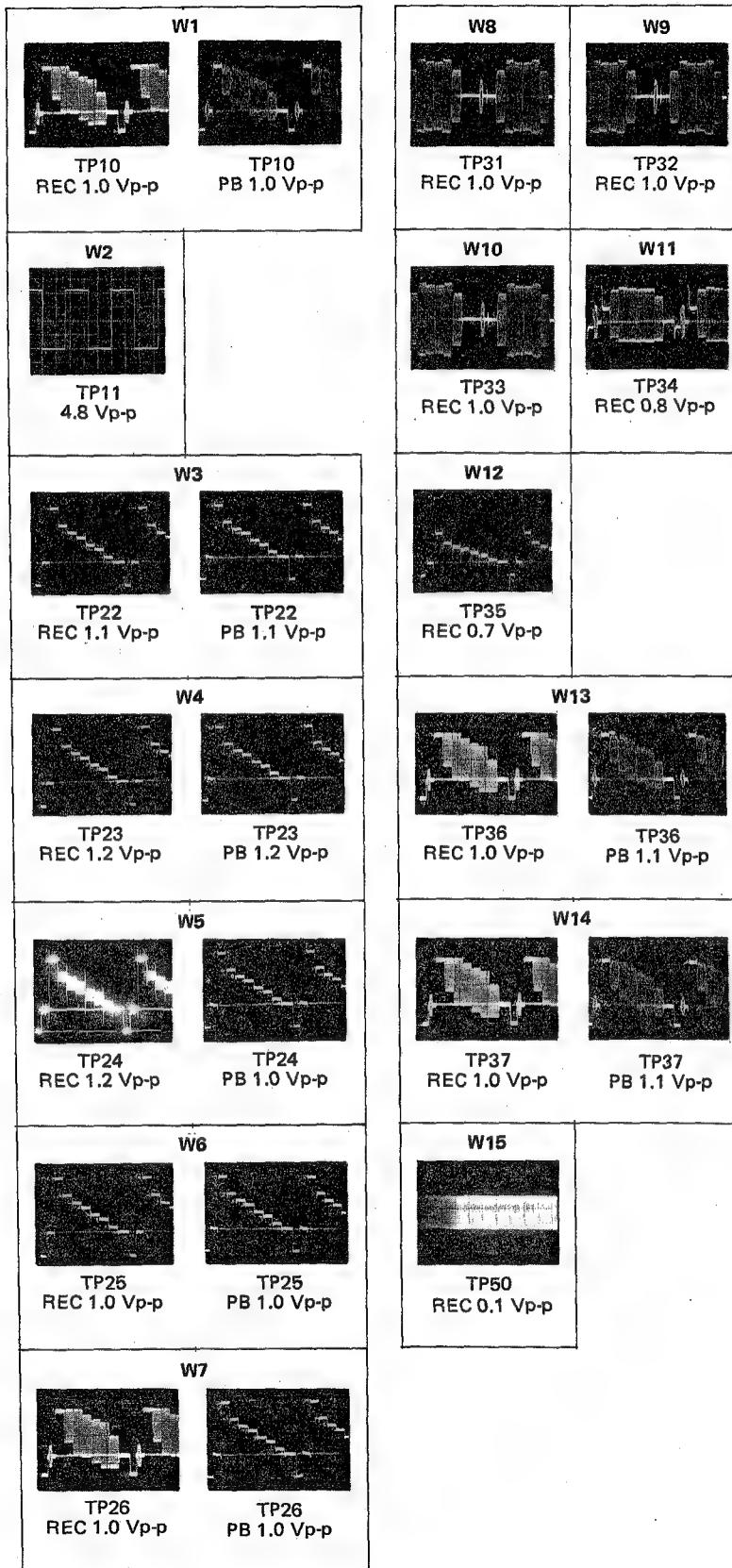


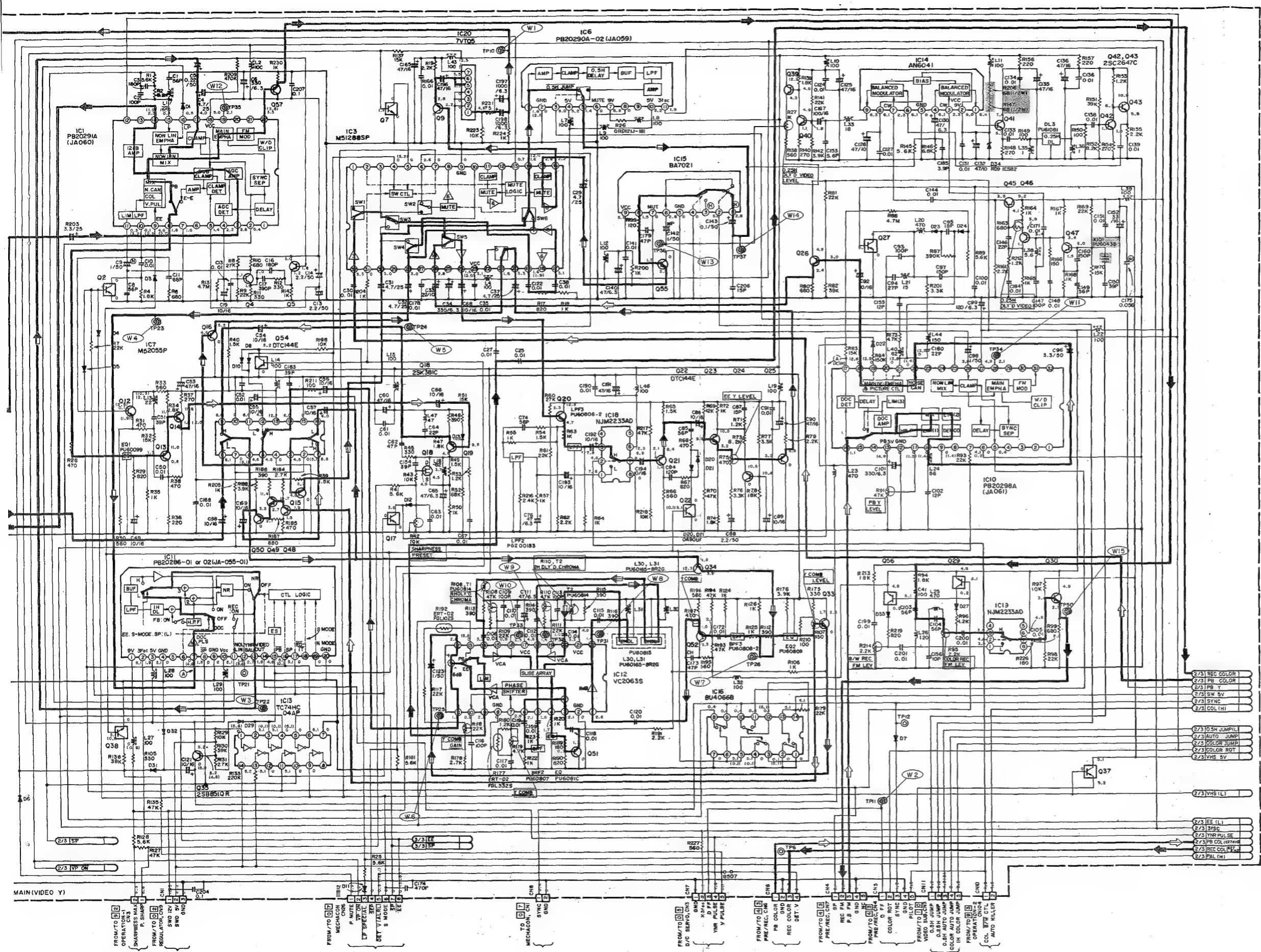


4.12 MAIN (VIDEO) SCHEMATIC DIAGRAM

— Y SECTION —

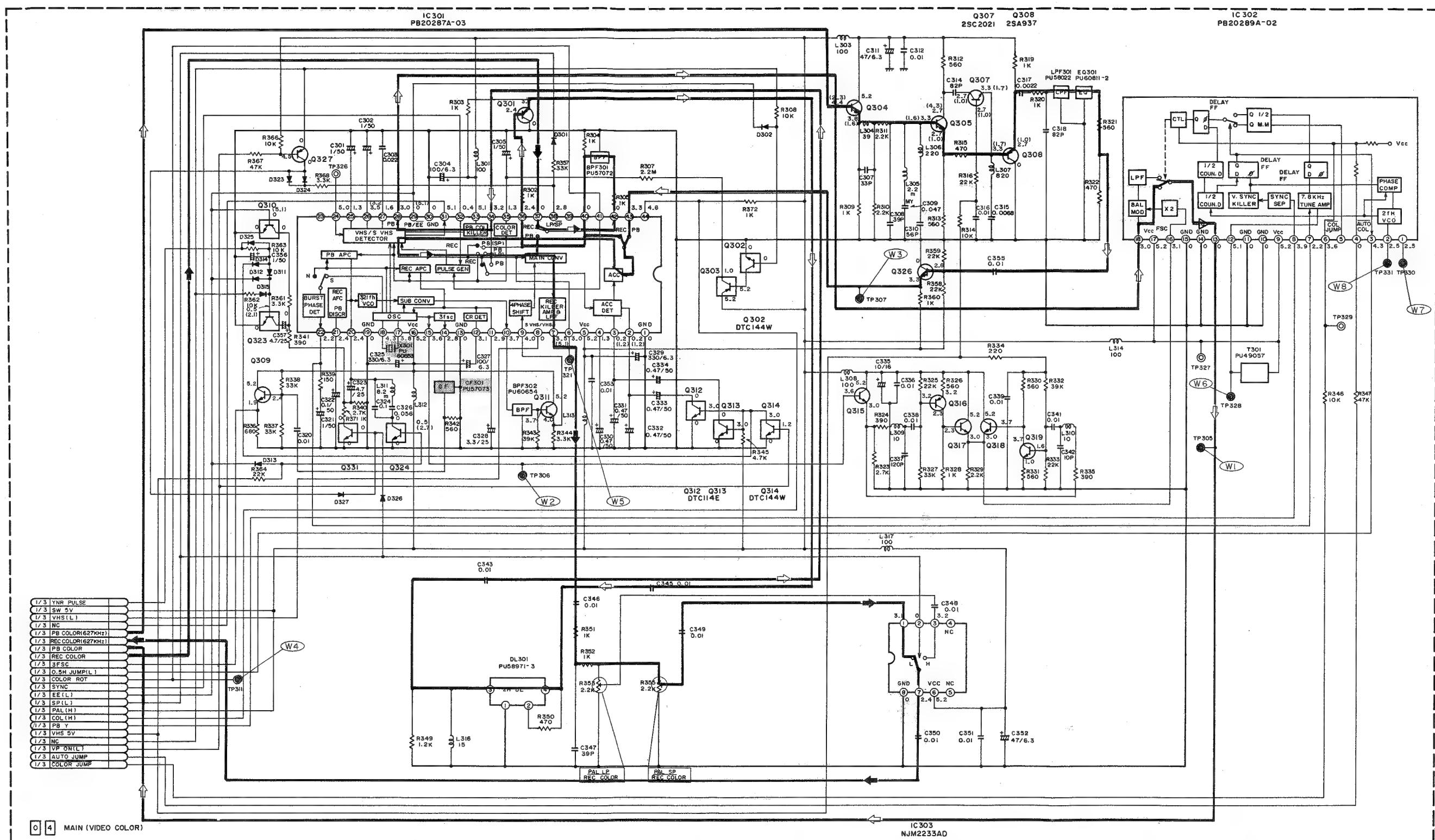
– MAIN WAVEFORMS OF VIDEO CIRCUIT –



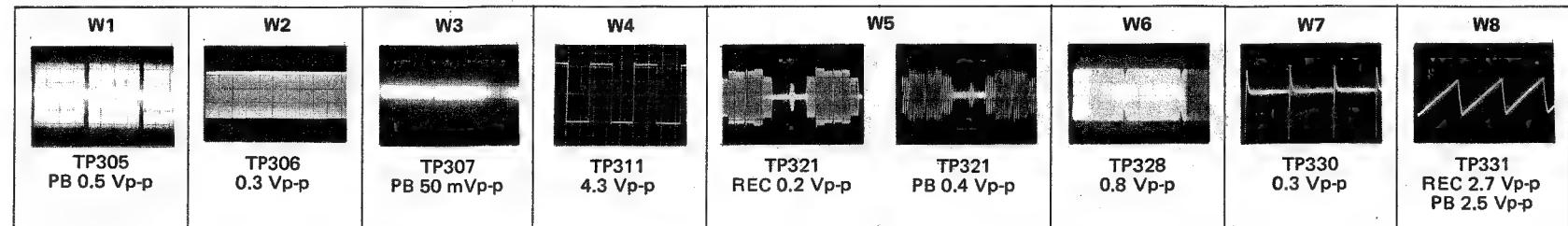


E F G 4-14 H 4-14 I J K L

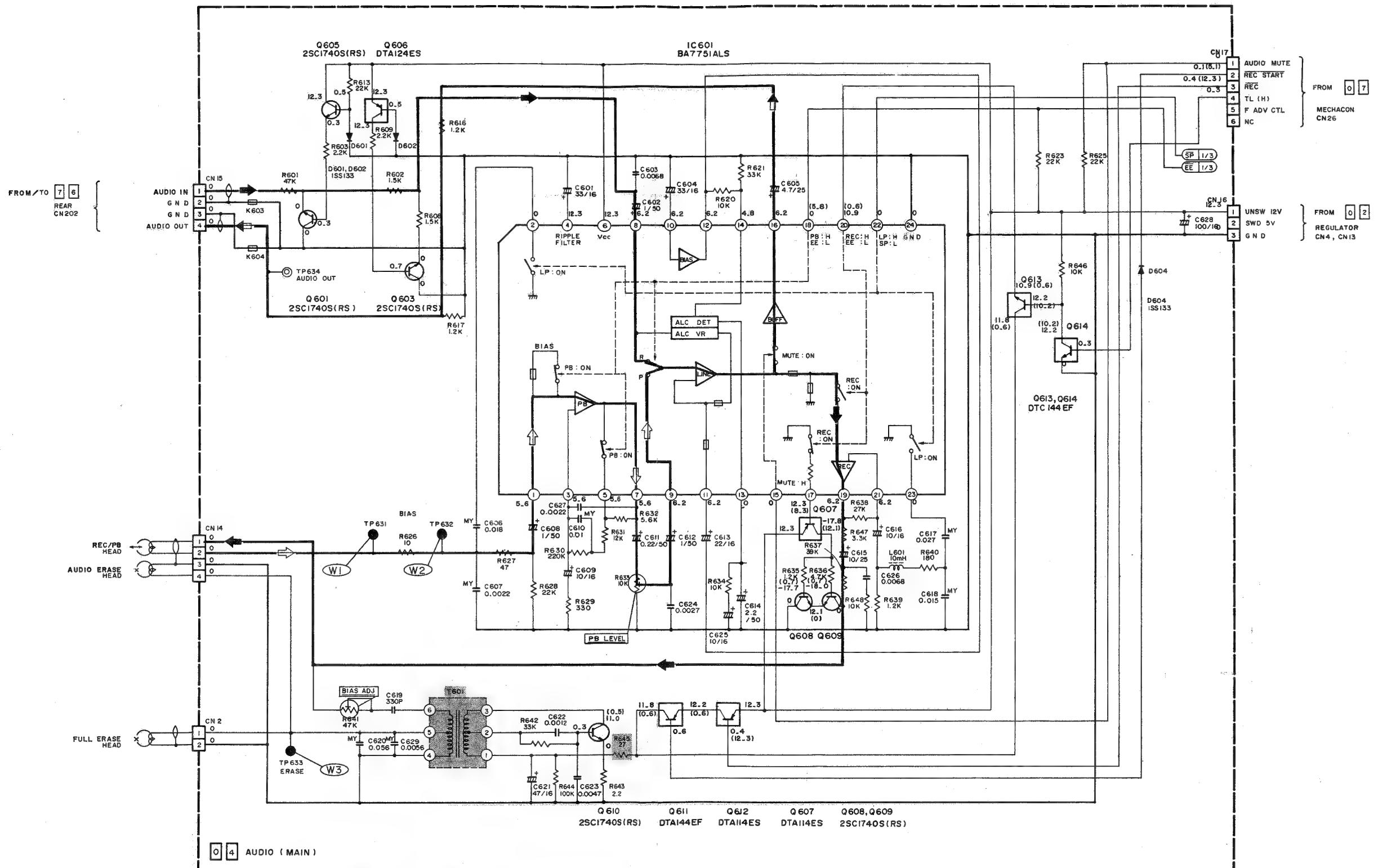
— COLOR SECTION —



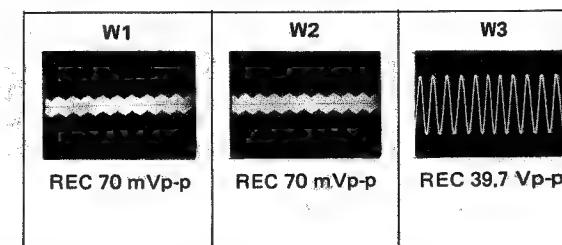
– MAIN WAVEFORMS OF VIDEO CIRCUIT –



4.13 MAIN (AUDIO) SCHEMATIC DIAGRAM



– MAIN WAVEFORMS OF AUDIO CIRCUIT –



4-16

4-16

E

1

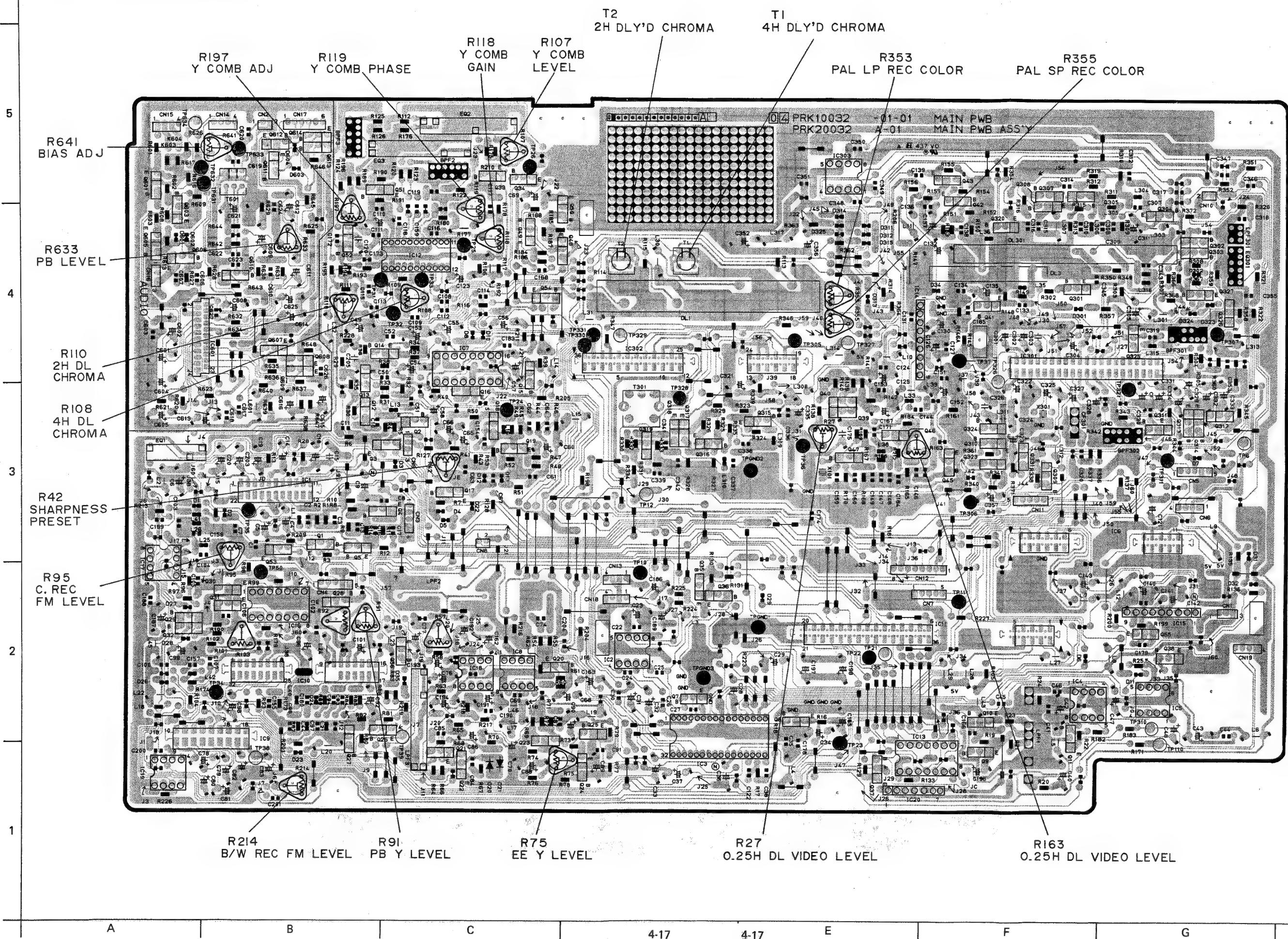
F

1

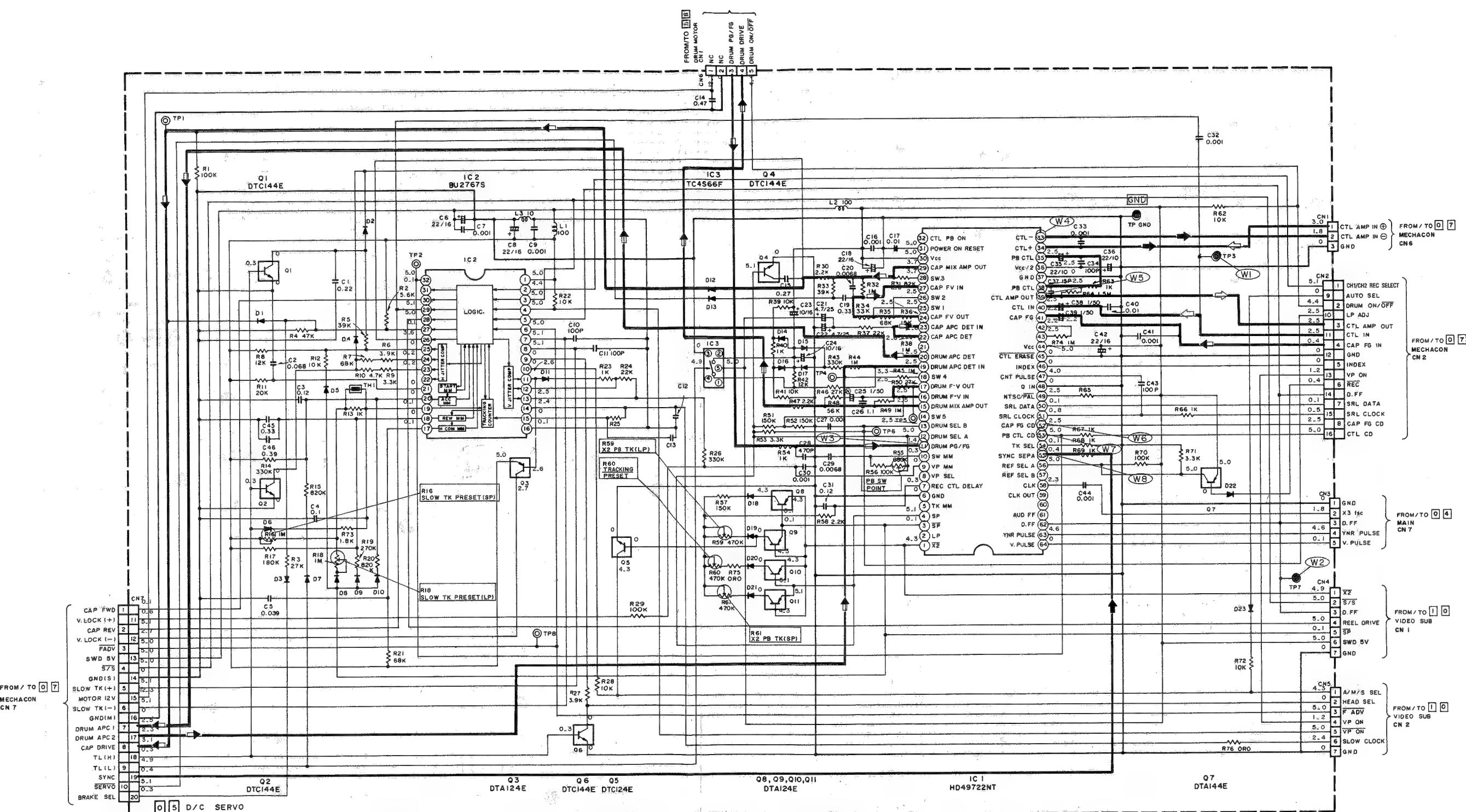
G

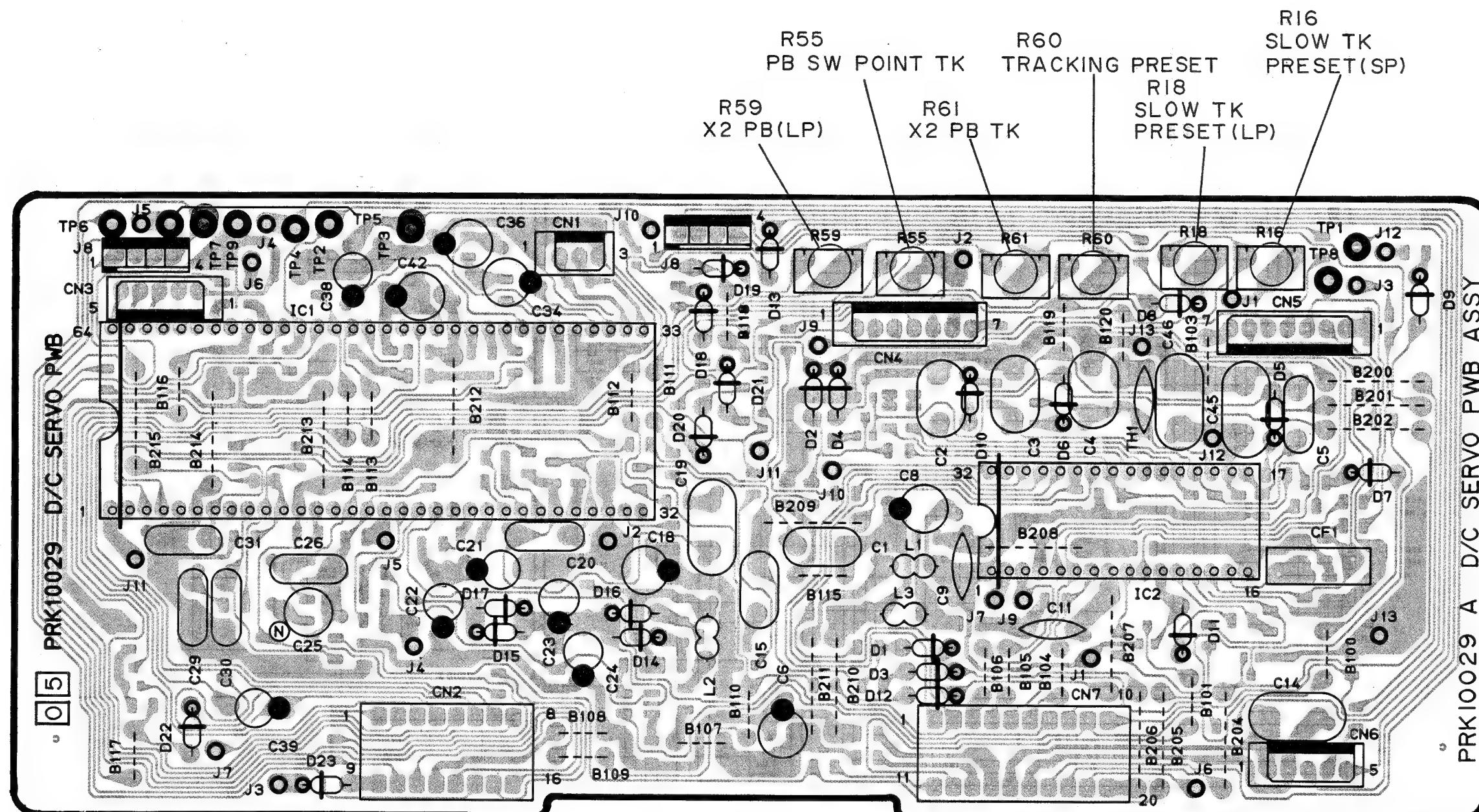
1

4.14 MAIN CIRCUIT BOARD

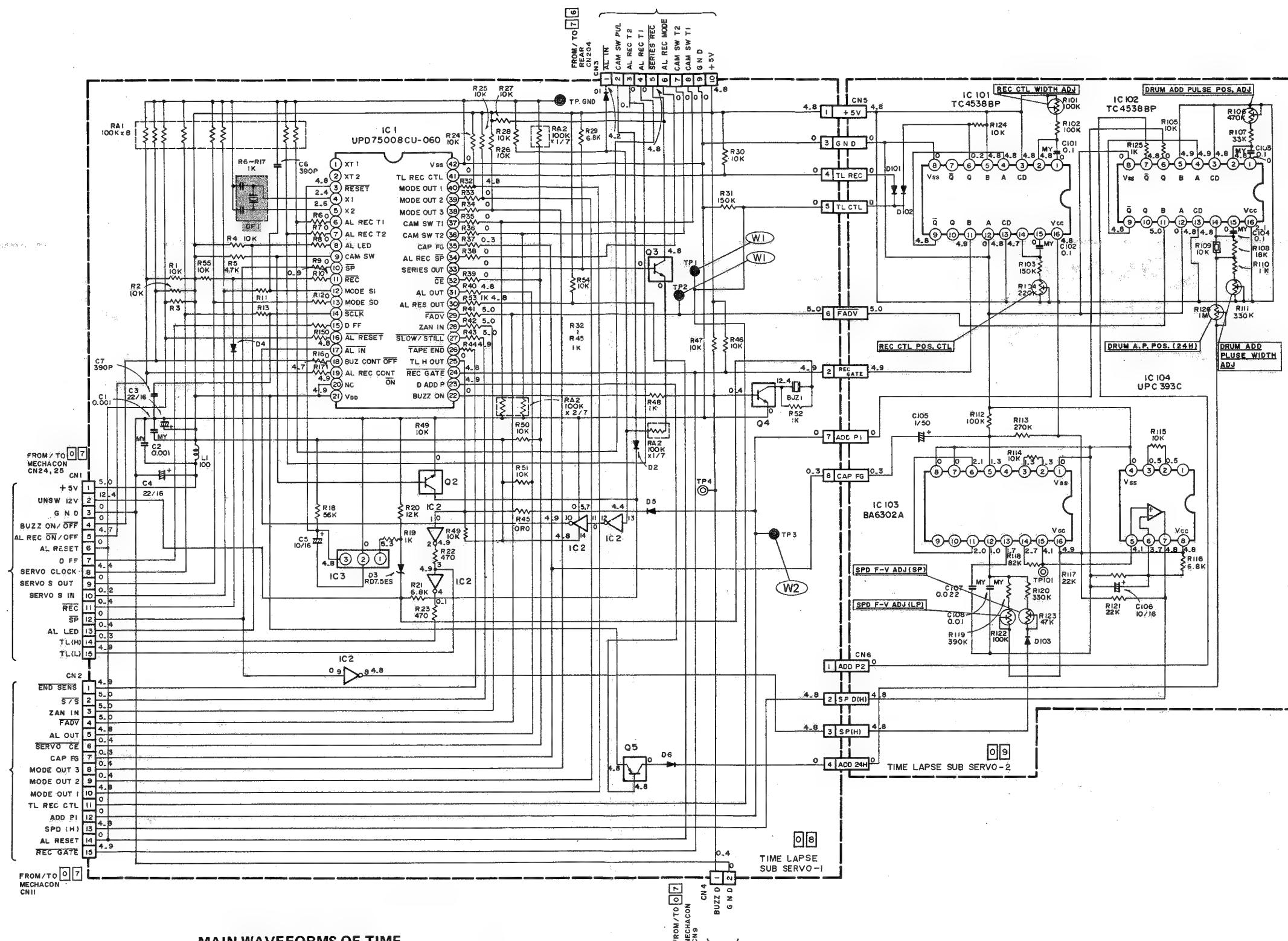


4.15 D/C SERVO SCHEMATIC DIAGRAM

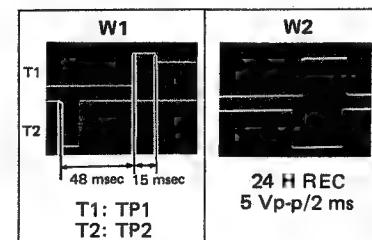


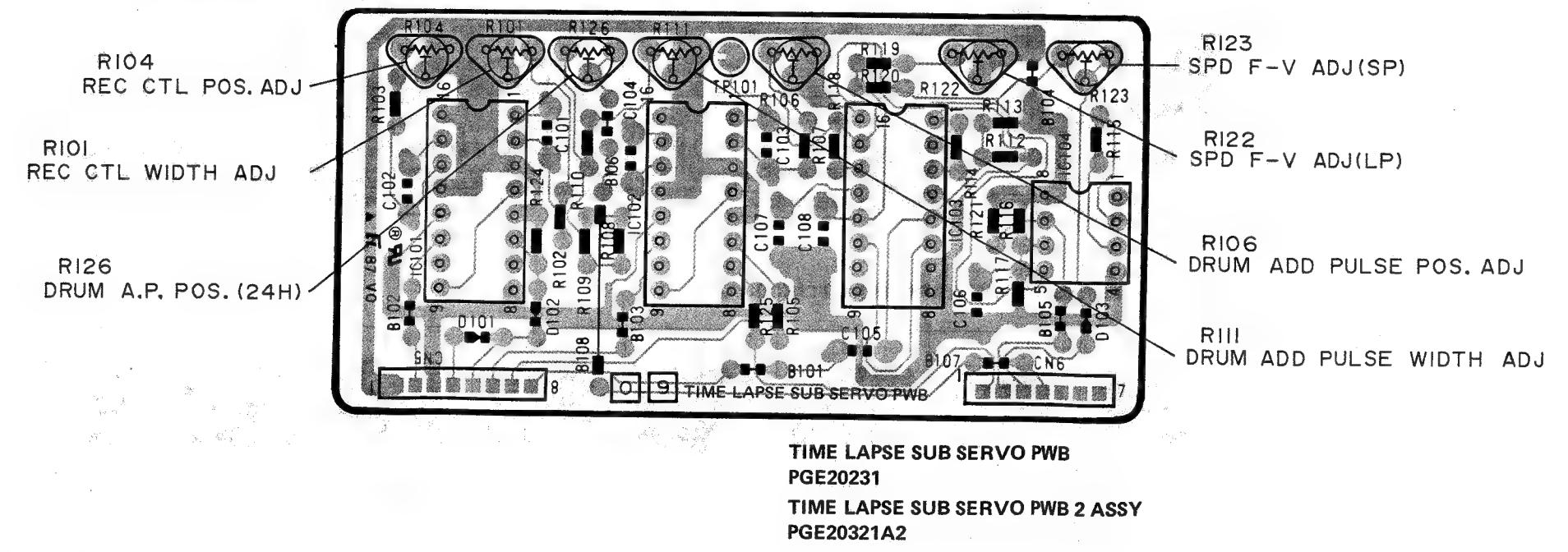
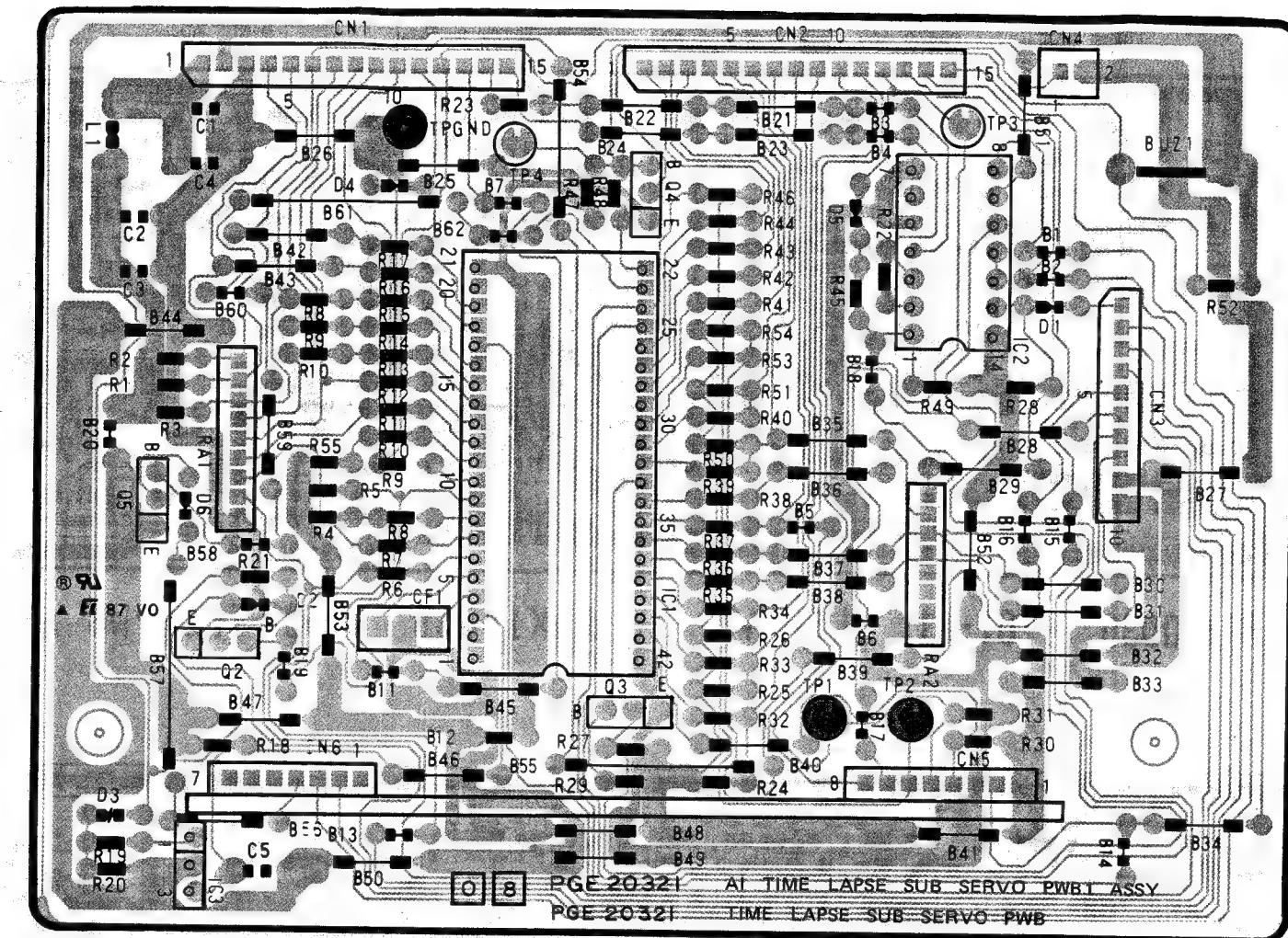


4.17 TIME LAPSE SUB SERVO SCHEMATIC DIAGRAM



— MAIN WAVEFORMS OF TIME LAPSE SUB SERVO CIRCUIT —

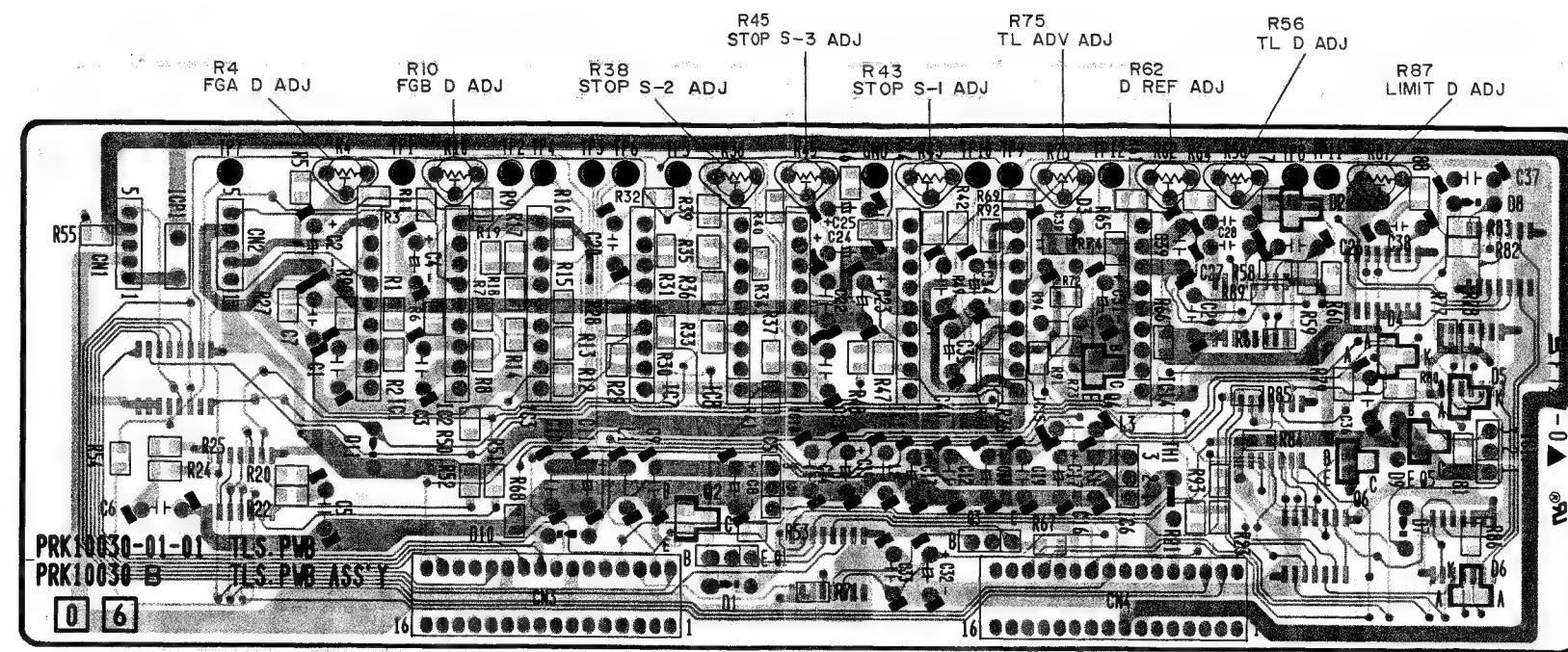




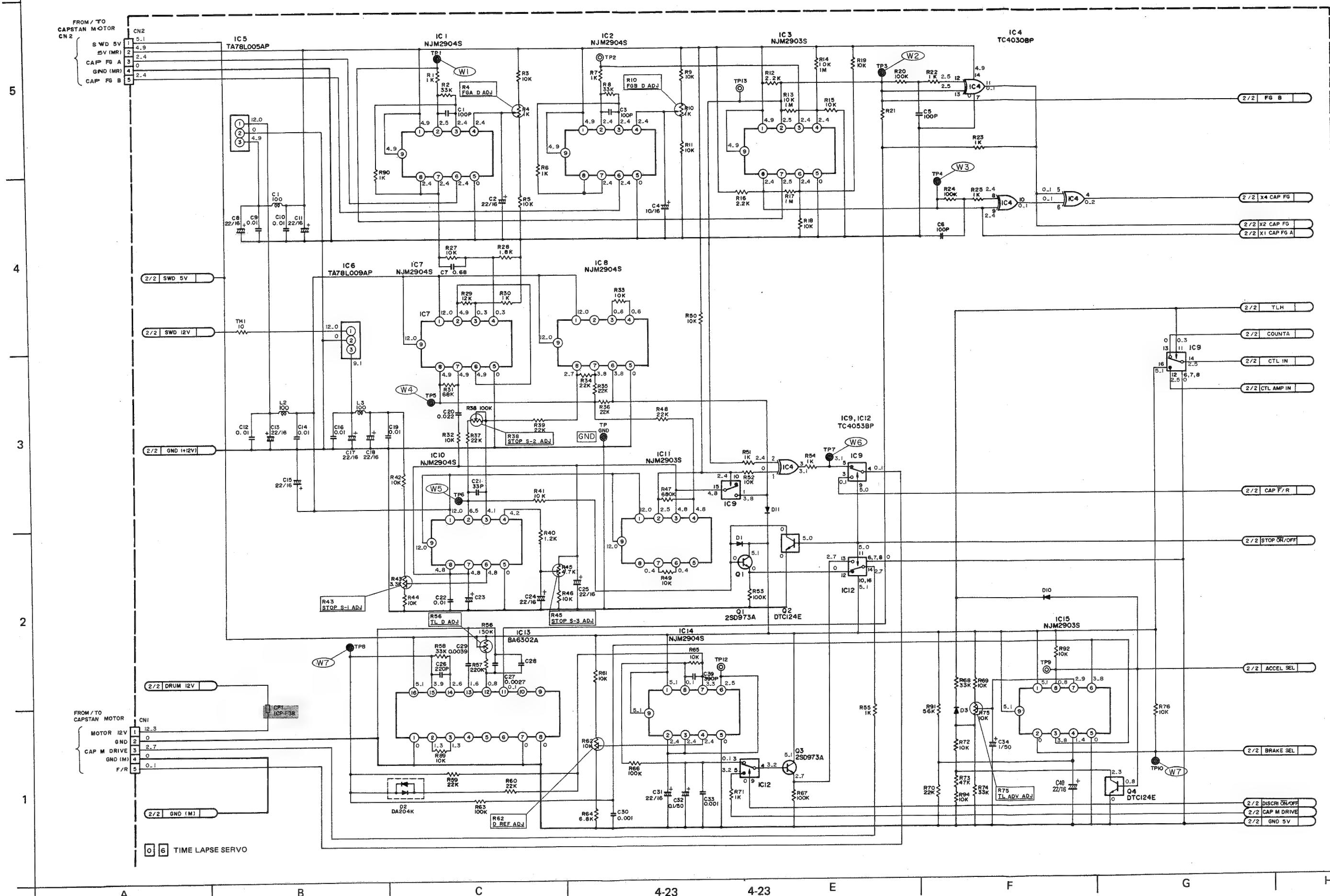
4.19 TIME LAPSE SERVO CIRCUIT BOARD

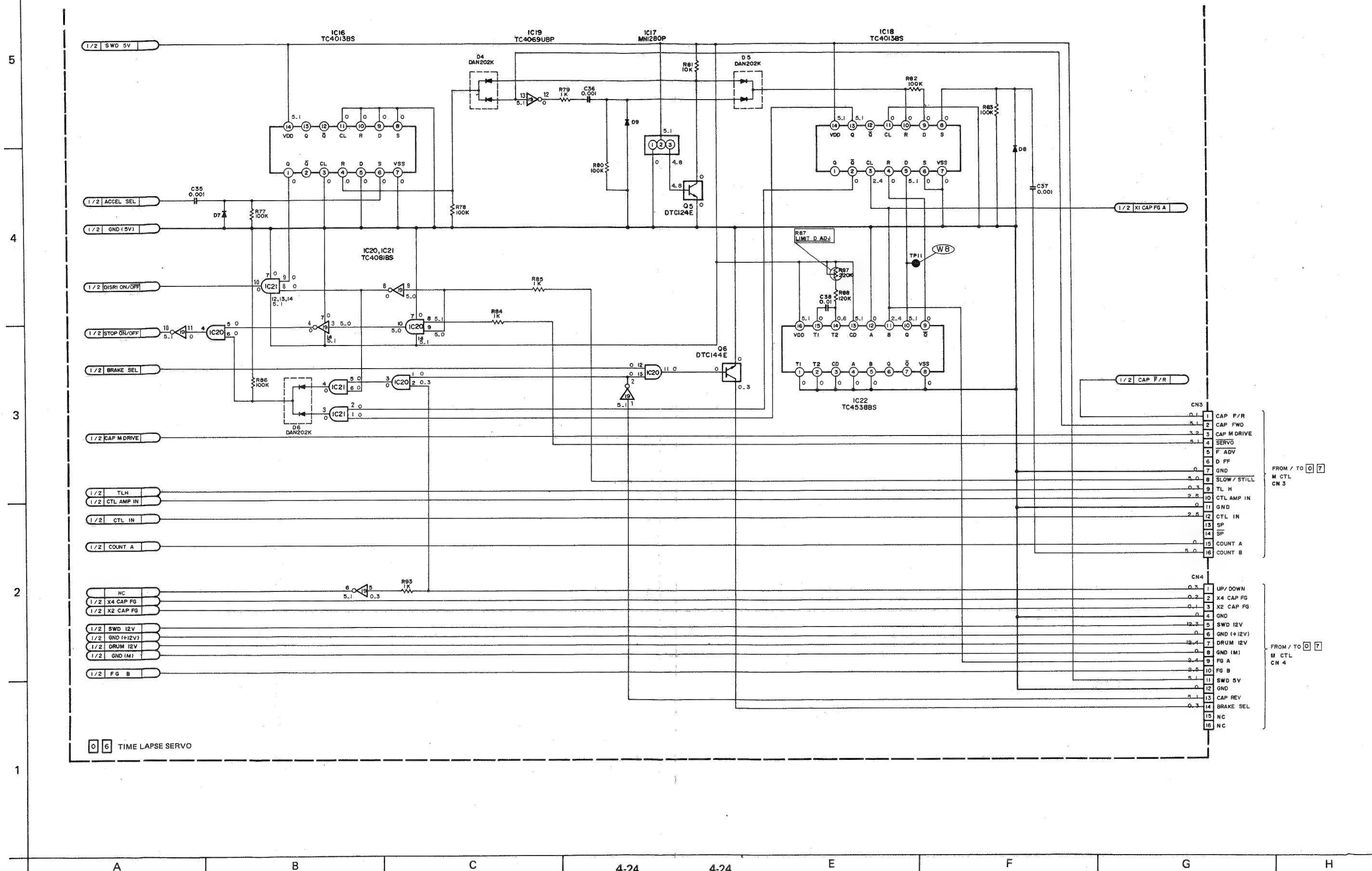
6
5
4
3
2
1

— REAR —

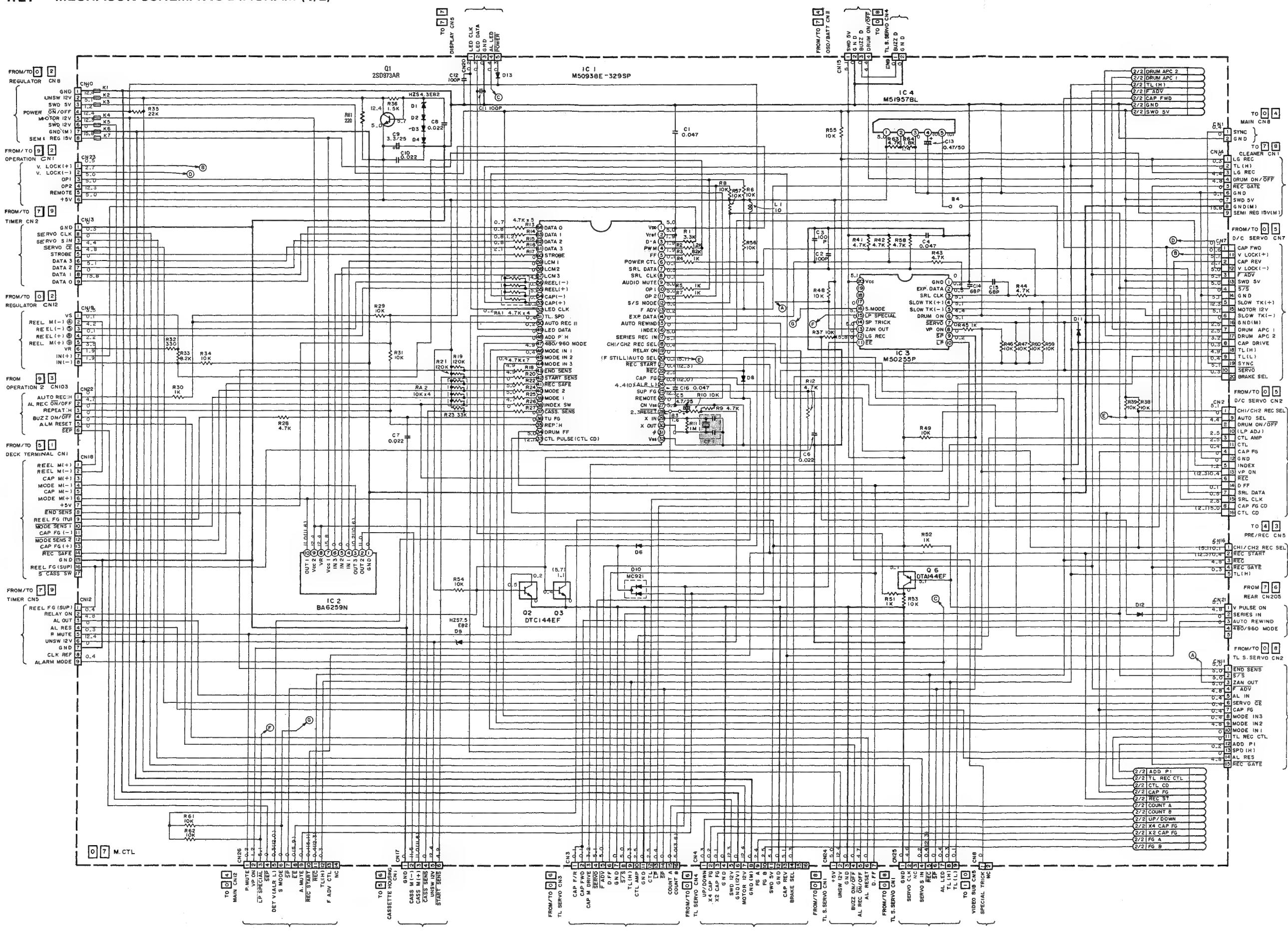


4.20 TIME LAPSE SERVO SCHEMATIC DIAGRAM (1/2)

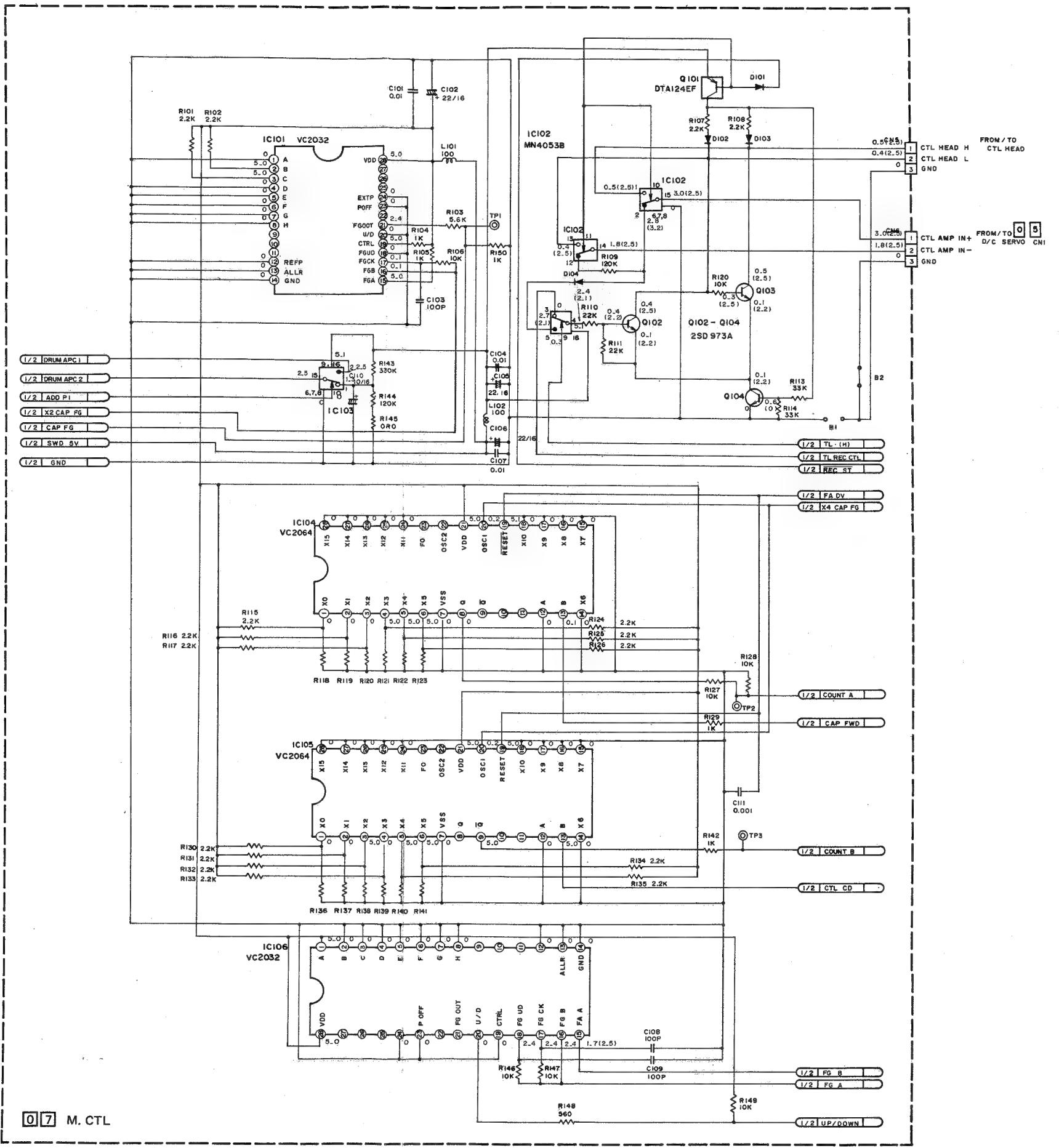




4.21 MECHAON SCHEMATIC DIAGRAM (1/2)



6 – MECHACON SCHEMATIC DIAGRAM (2/2) –



07 M. CTI

4

10

1

4-26

4-25

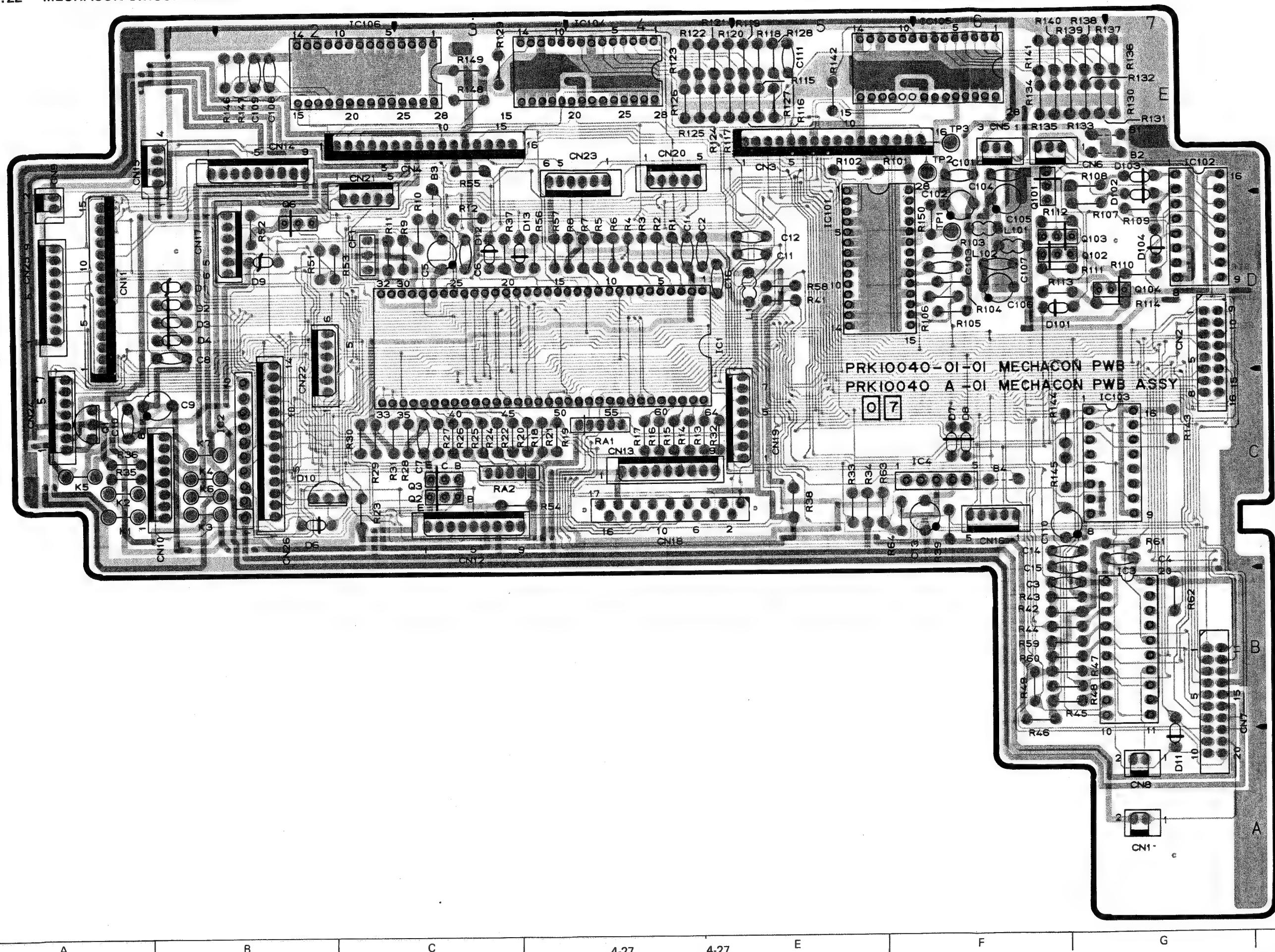
1000

100

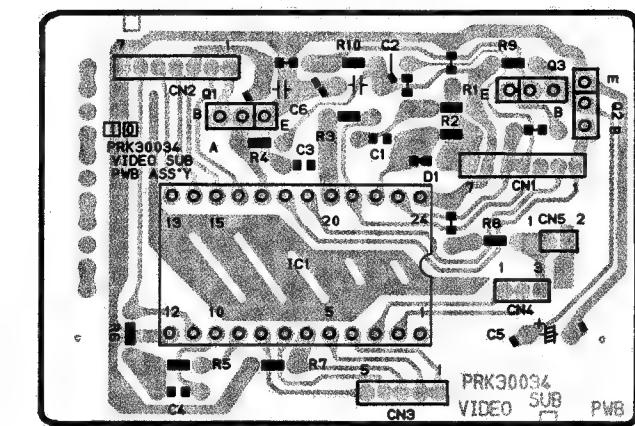
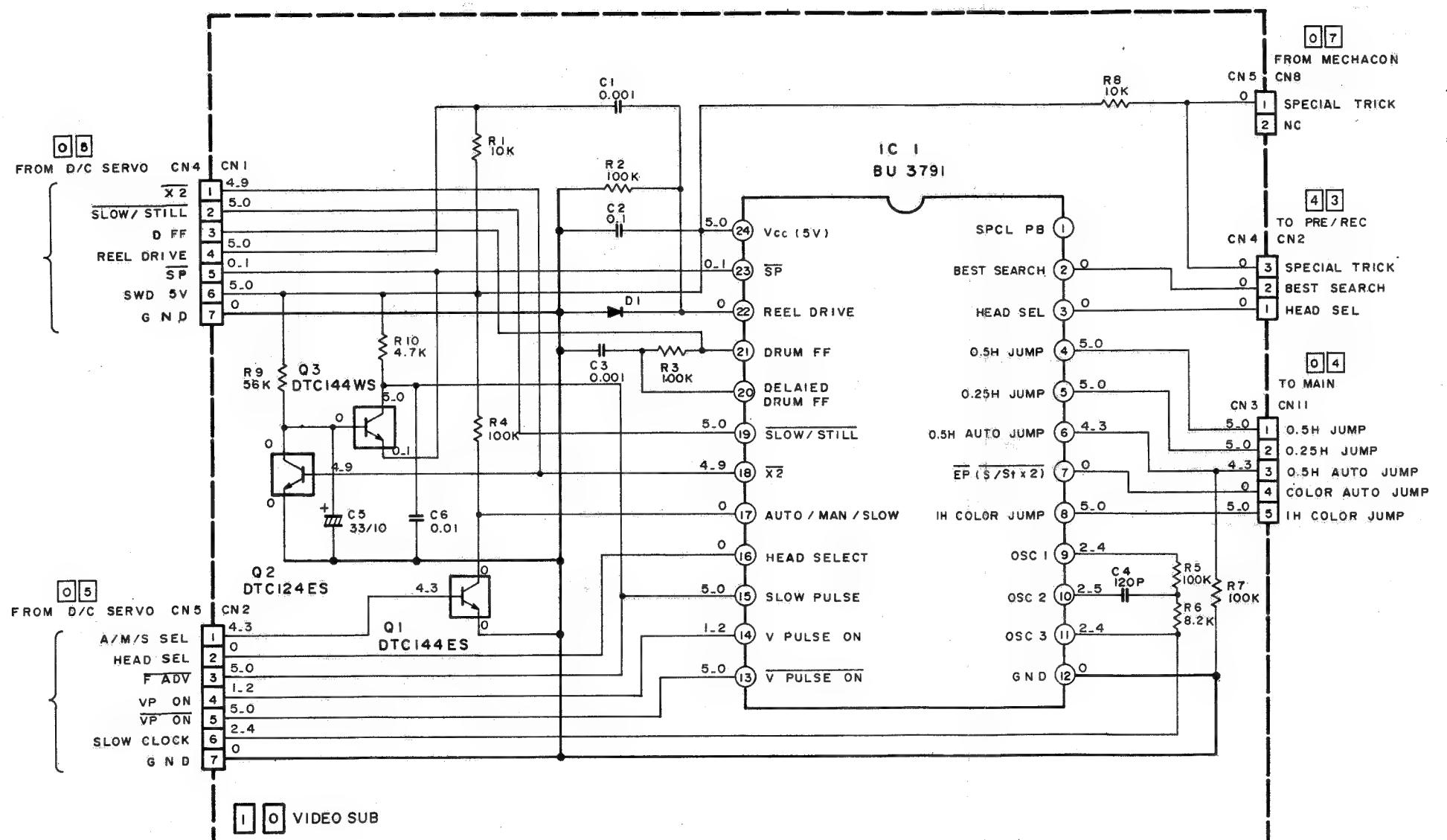
G

H

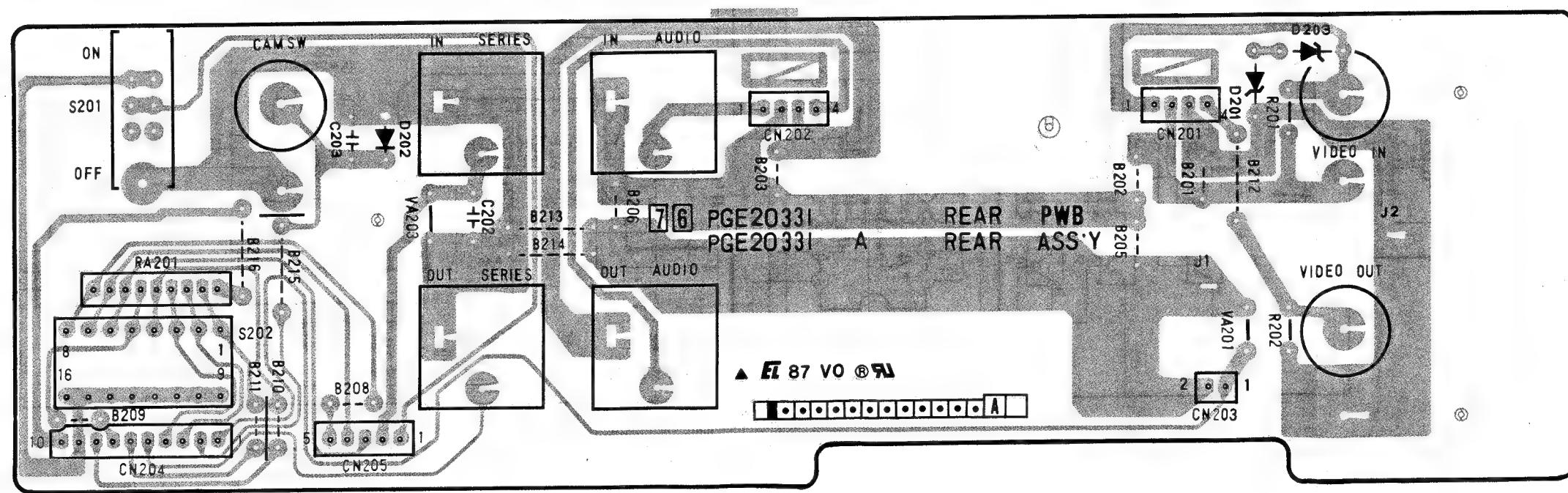
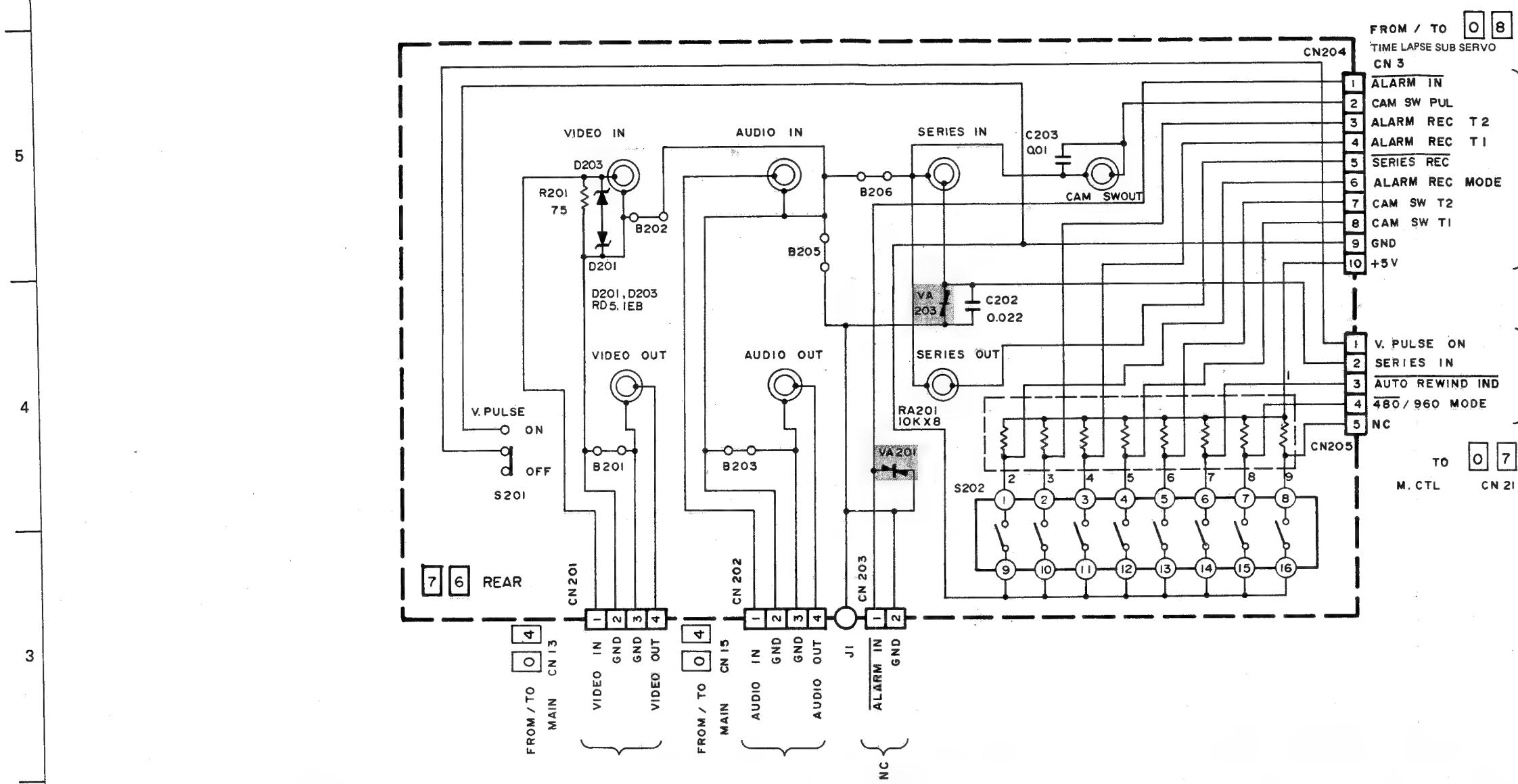
4.22 MECHAON CIRCUIT BOARD



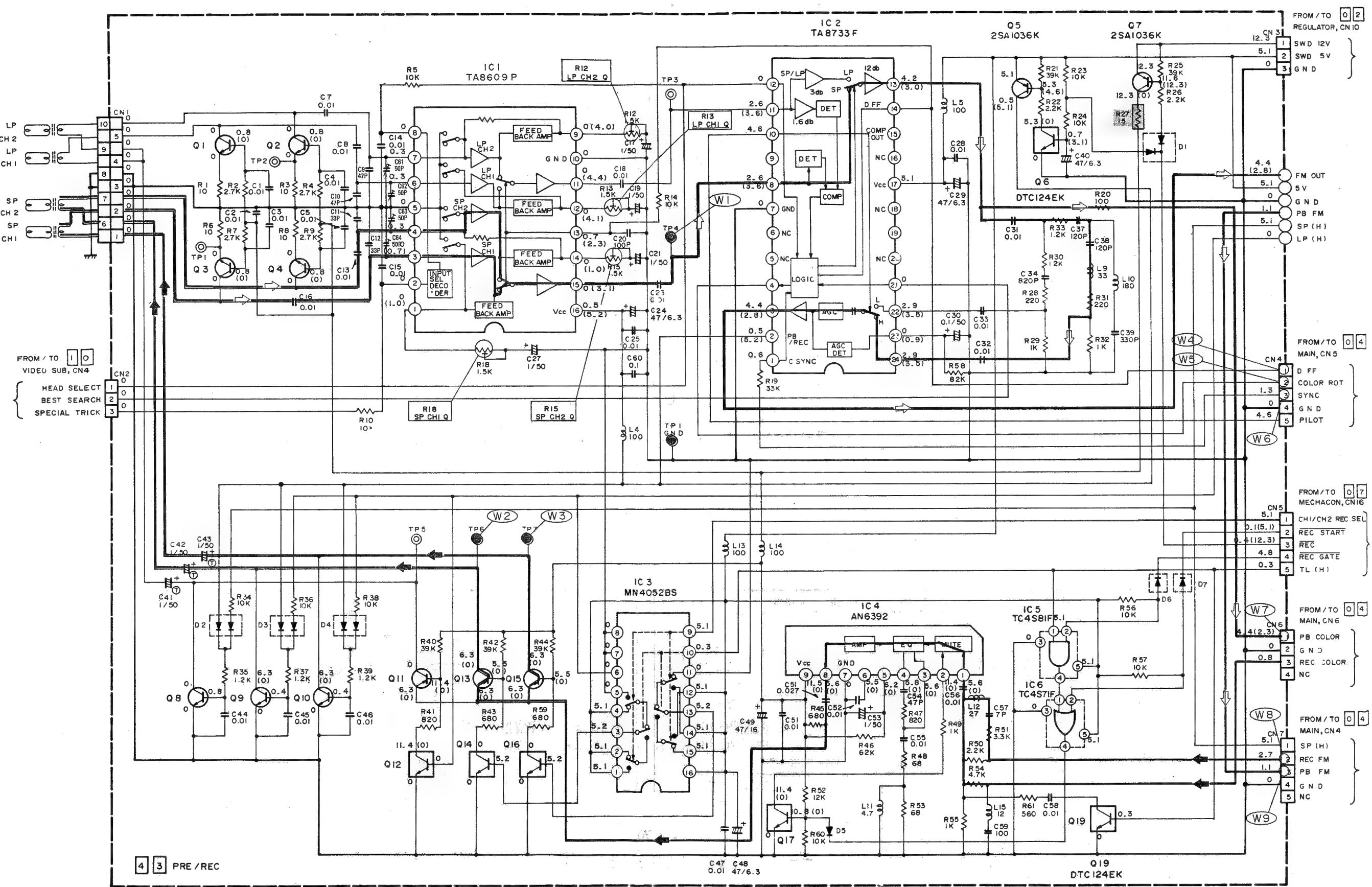
4.23 VIDEO SUB SCHEMATIC DIAGRAM & CIRCUIT BOARD



4.24 REAR SCHEMATIC DIAGRAM & CIRCUIT BOARD

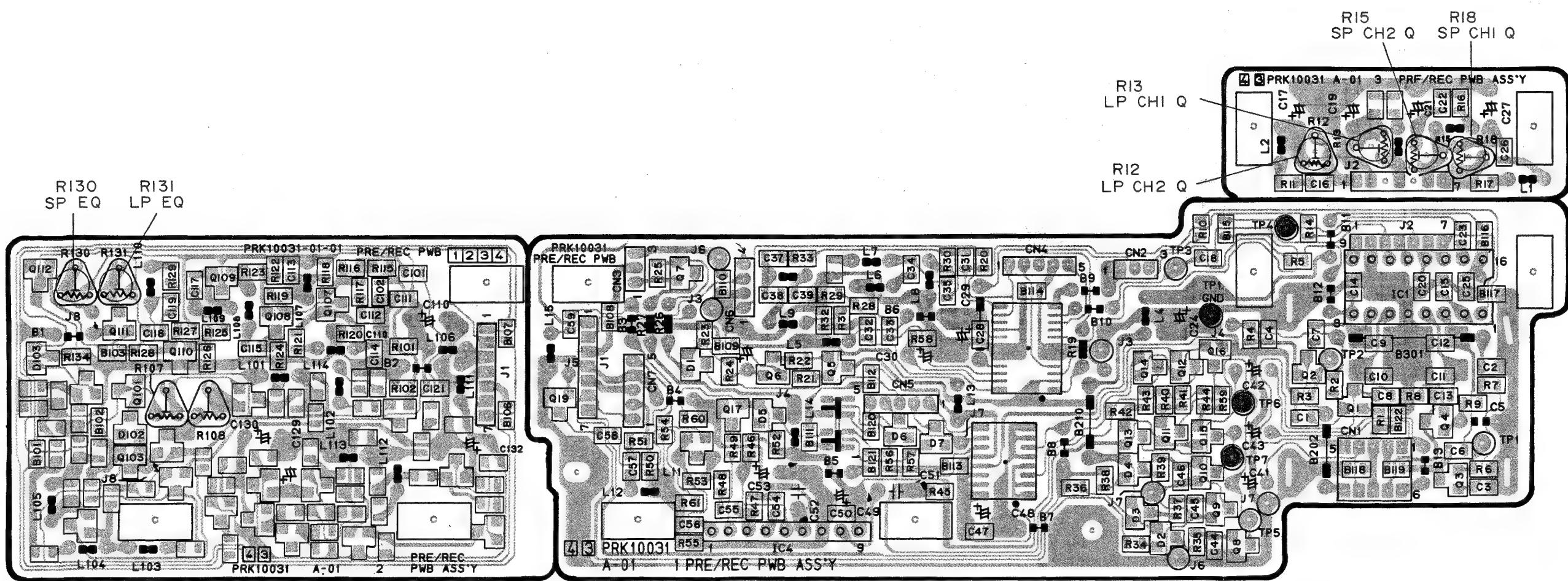
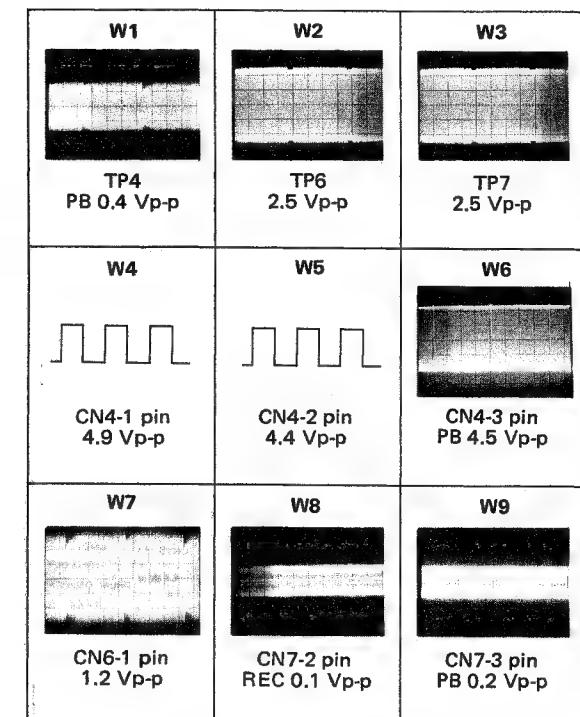
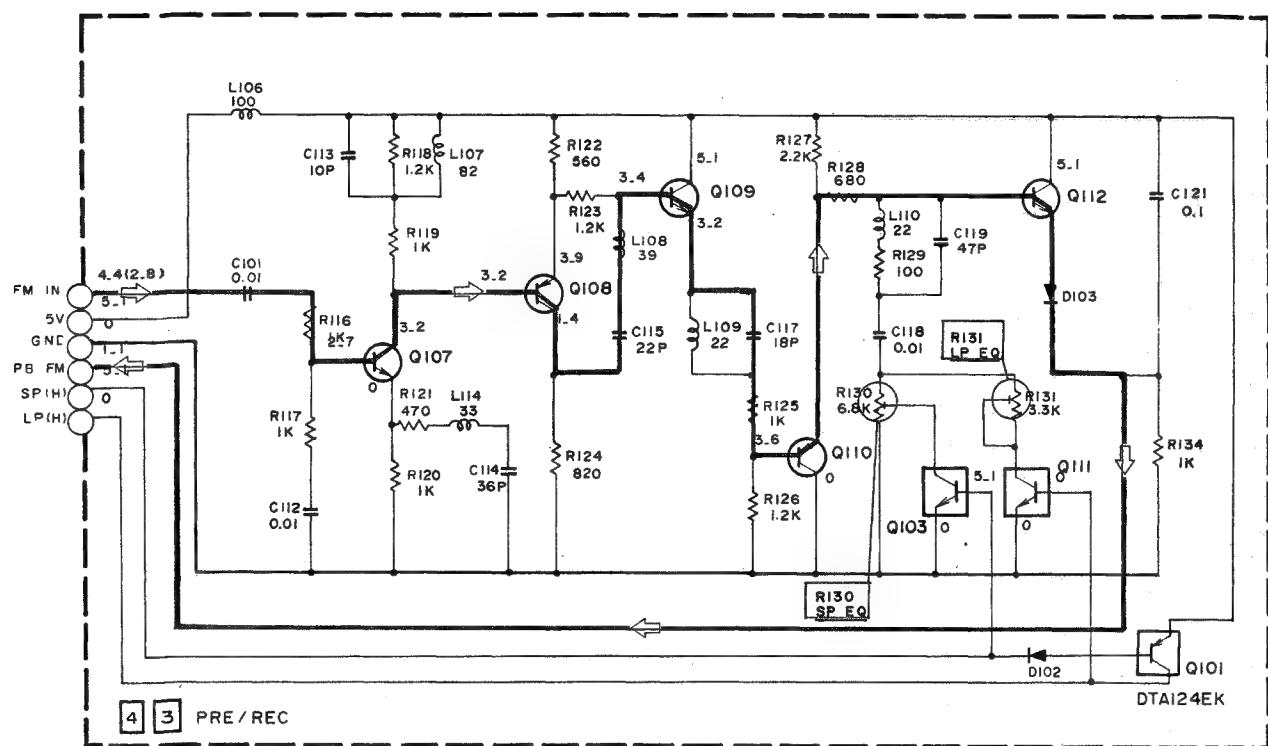


4.25 VIDEO PRE/REC SCHEMATIC DIAGRAM (1/2)

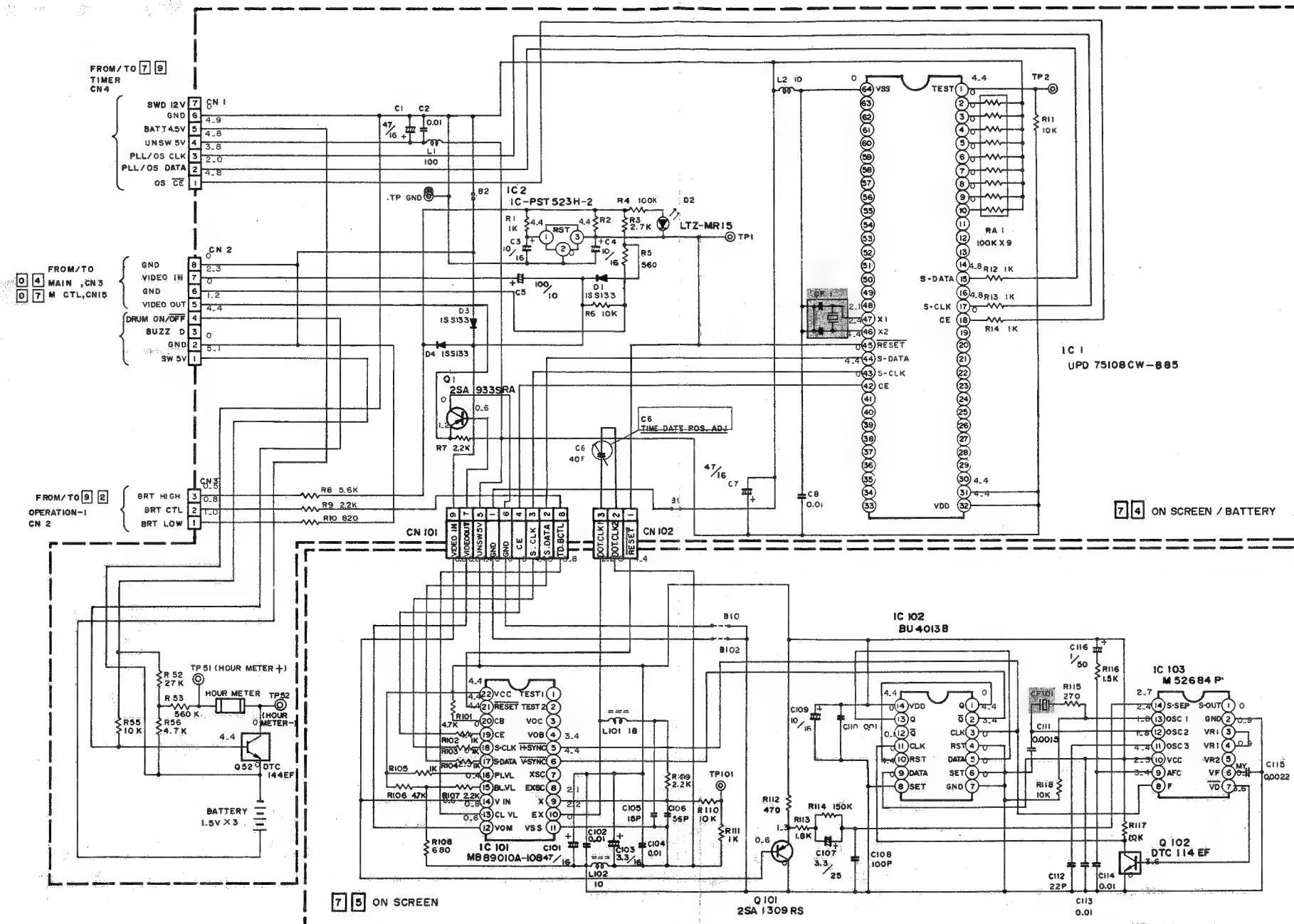


4.26 VIDEO PRE/REC SCHEMATIC DIAGRAM (2/2) & CIRCUIT BOARD

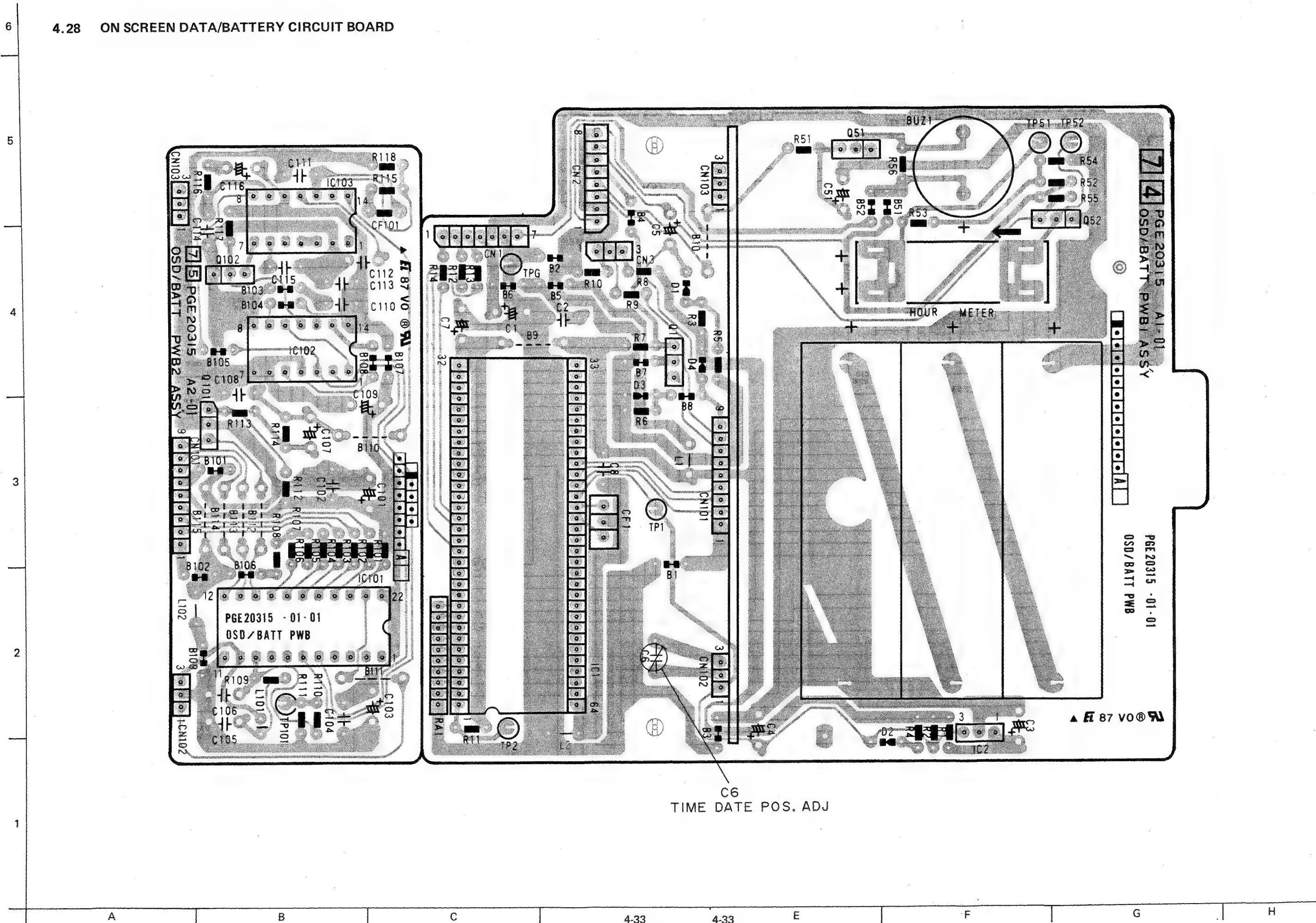
– MAIN WAVEFORMS OF VIDEO PRE/REC CIRCUIT –



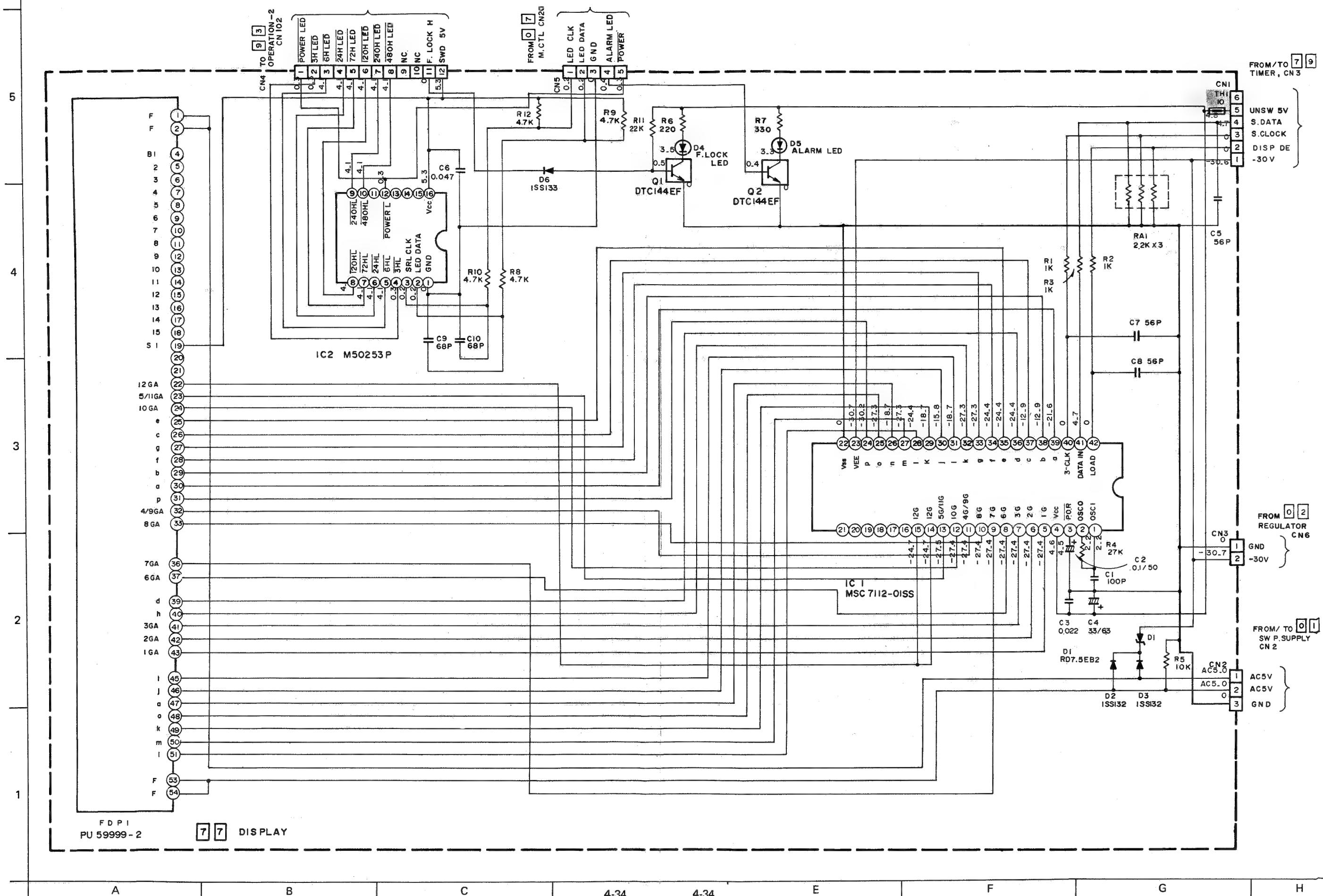
4.27 ON SCREEN DATA/BATTERY SCHEMATIC DIAGRAM



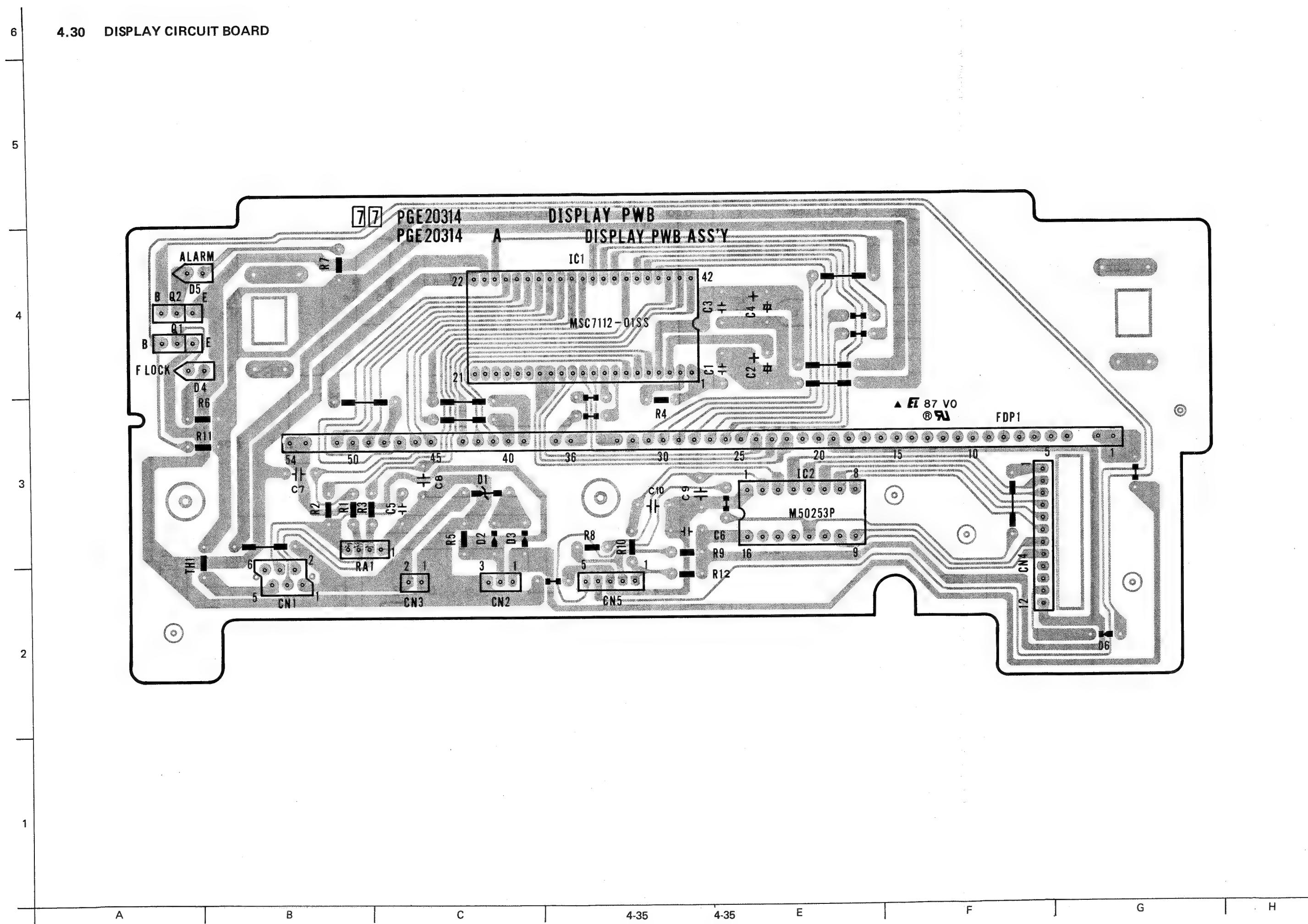
4.28 ON SCREEN DATA/BATTERY CIRCUIT BOARD



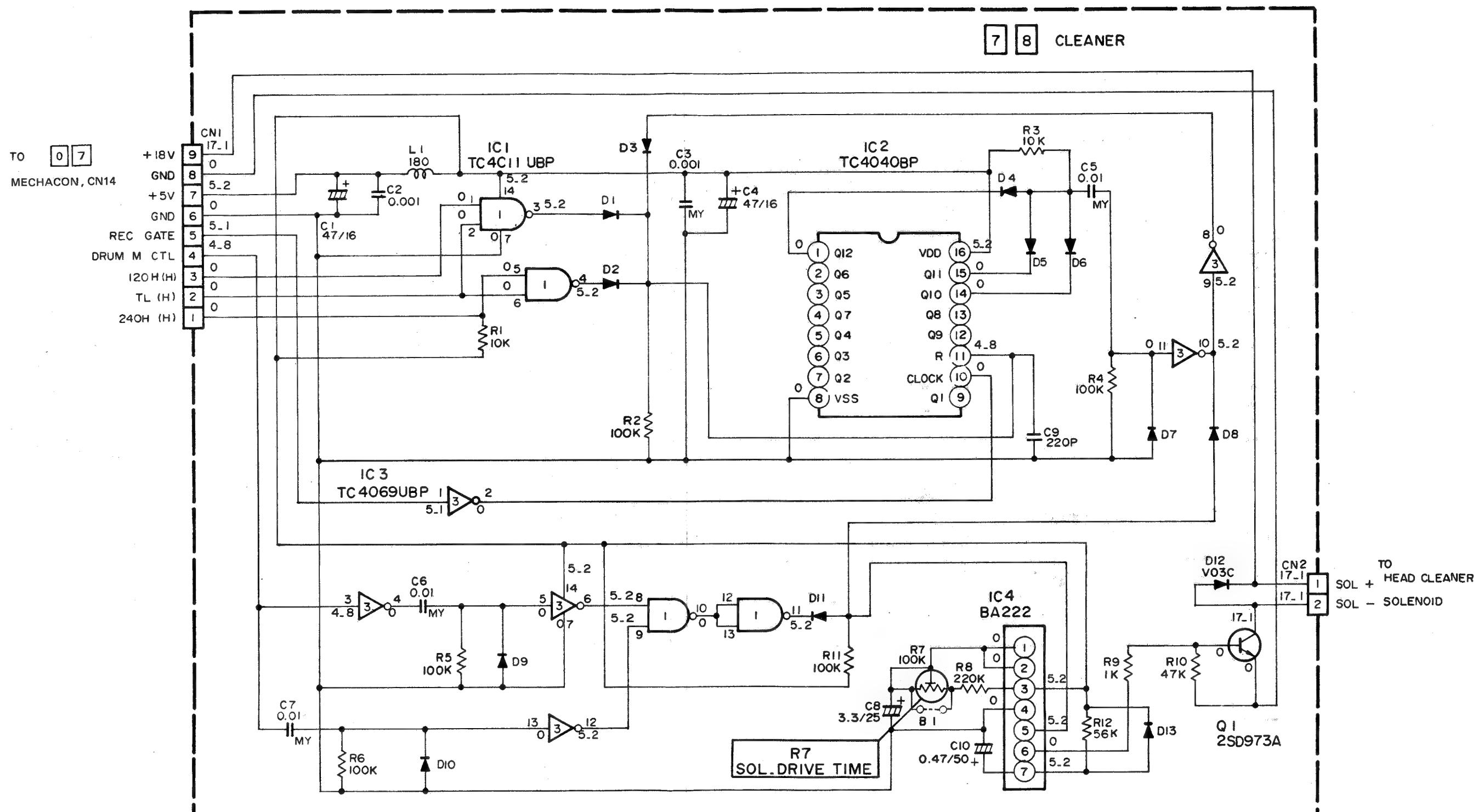
4.29 DISPLAY SCHEMATIC DIAGRAM



4.30 DISPLAY CIRCUIT BOARD

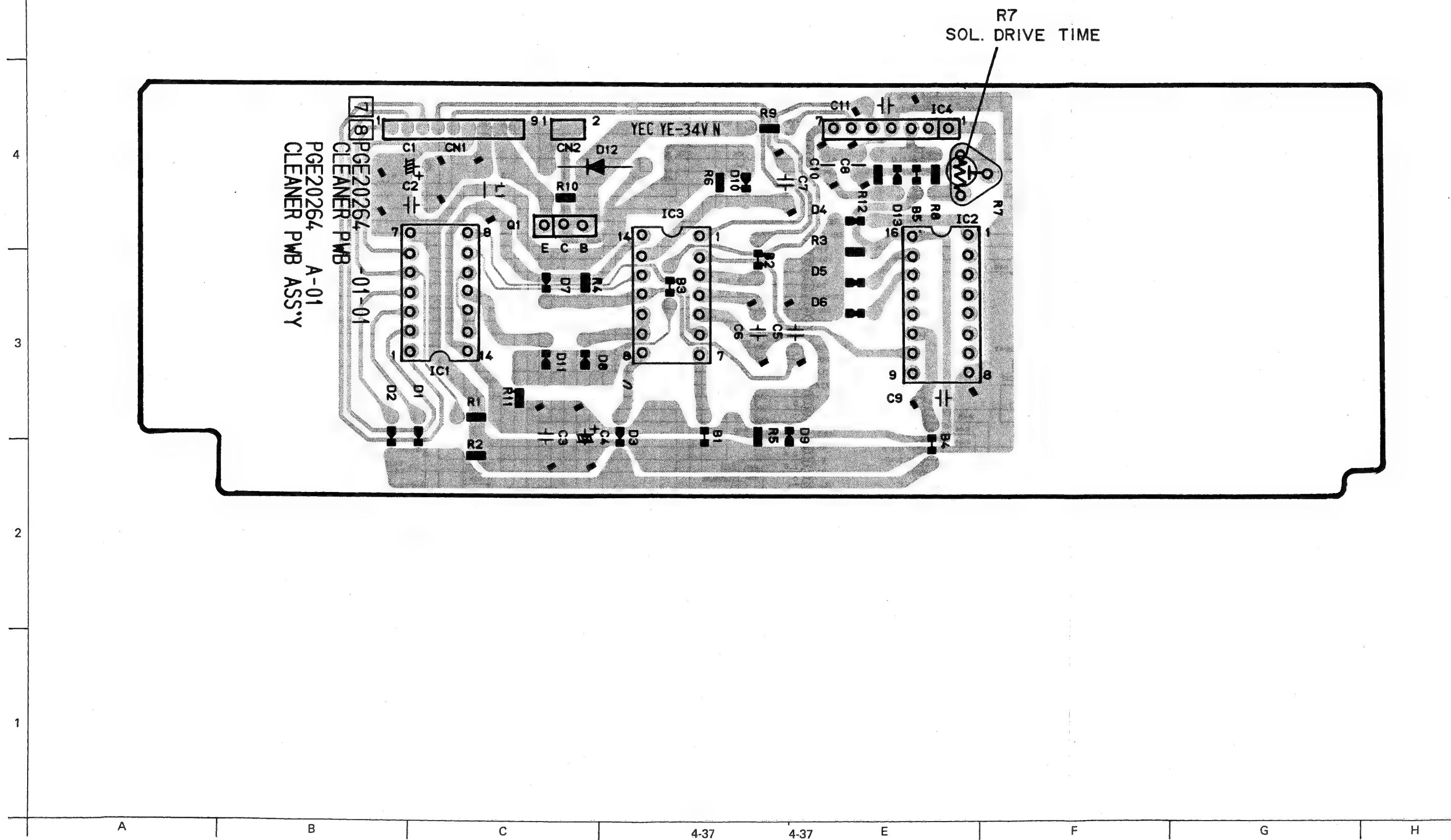


4.31 CLEANER SCHEMATIC DIAGRAM

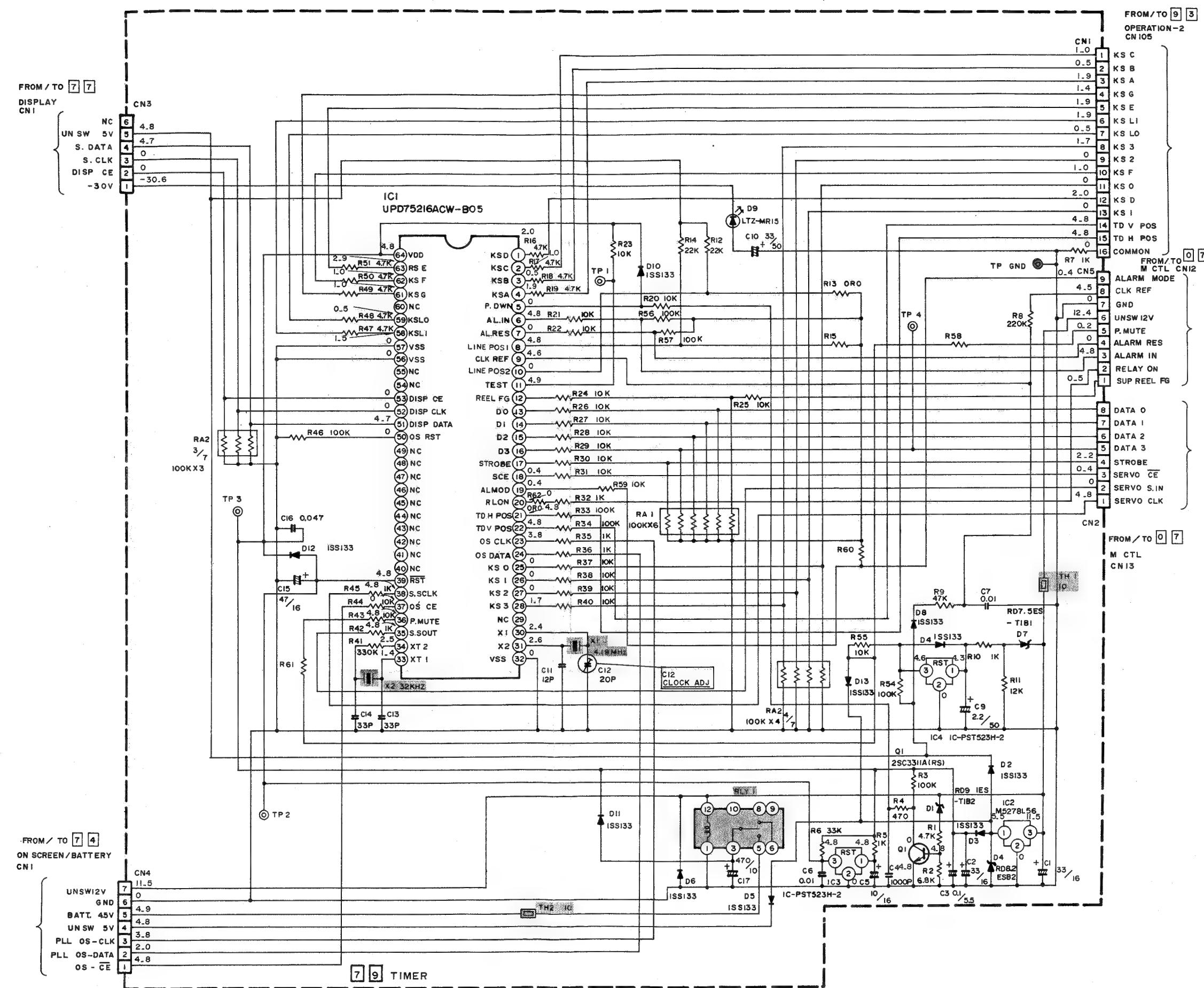


A B C 4-36 4-36 E F G H

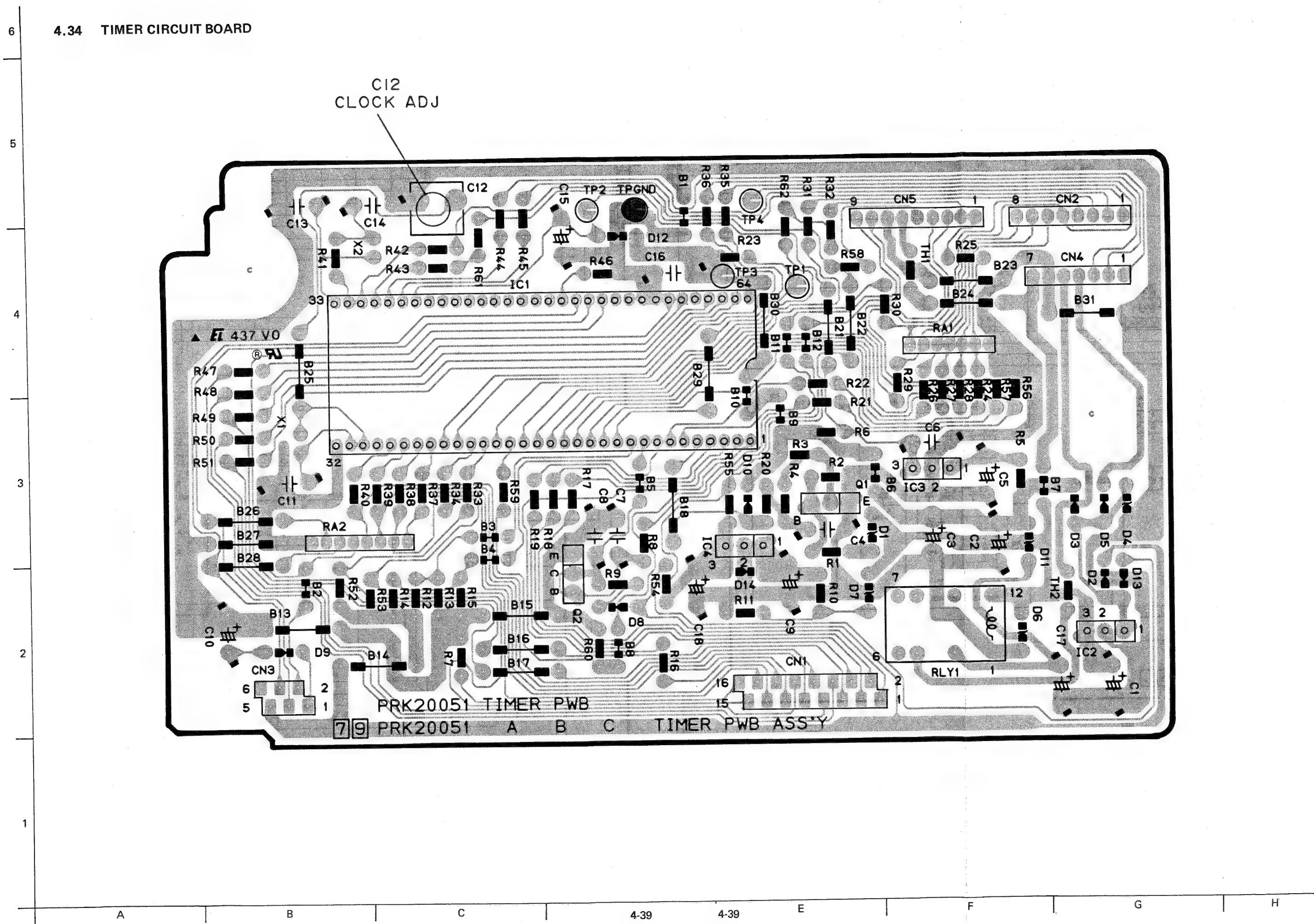
4.32 CLEANER CIRCUIT BOARD



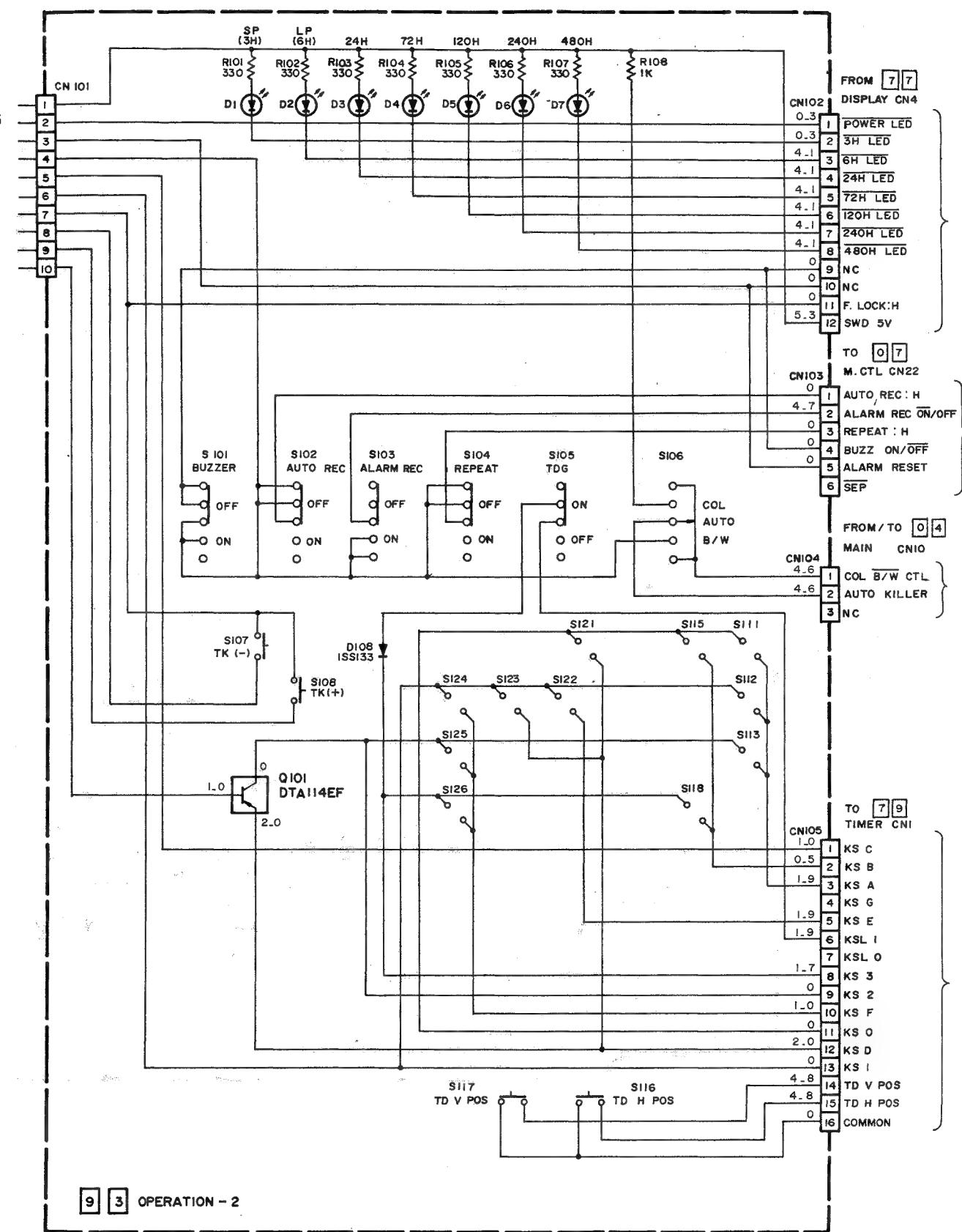
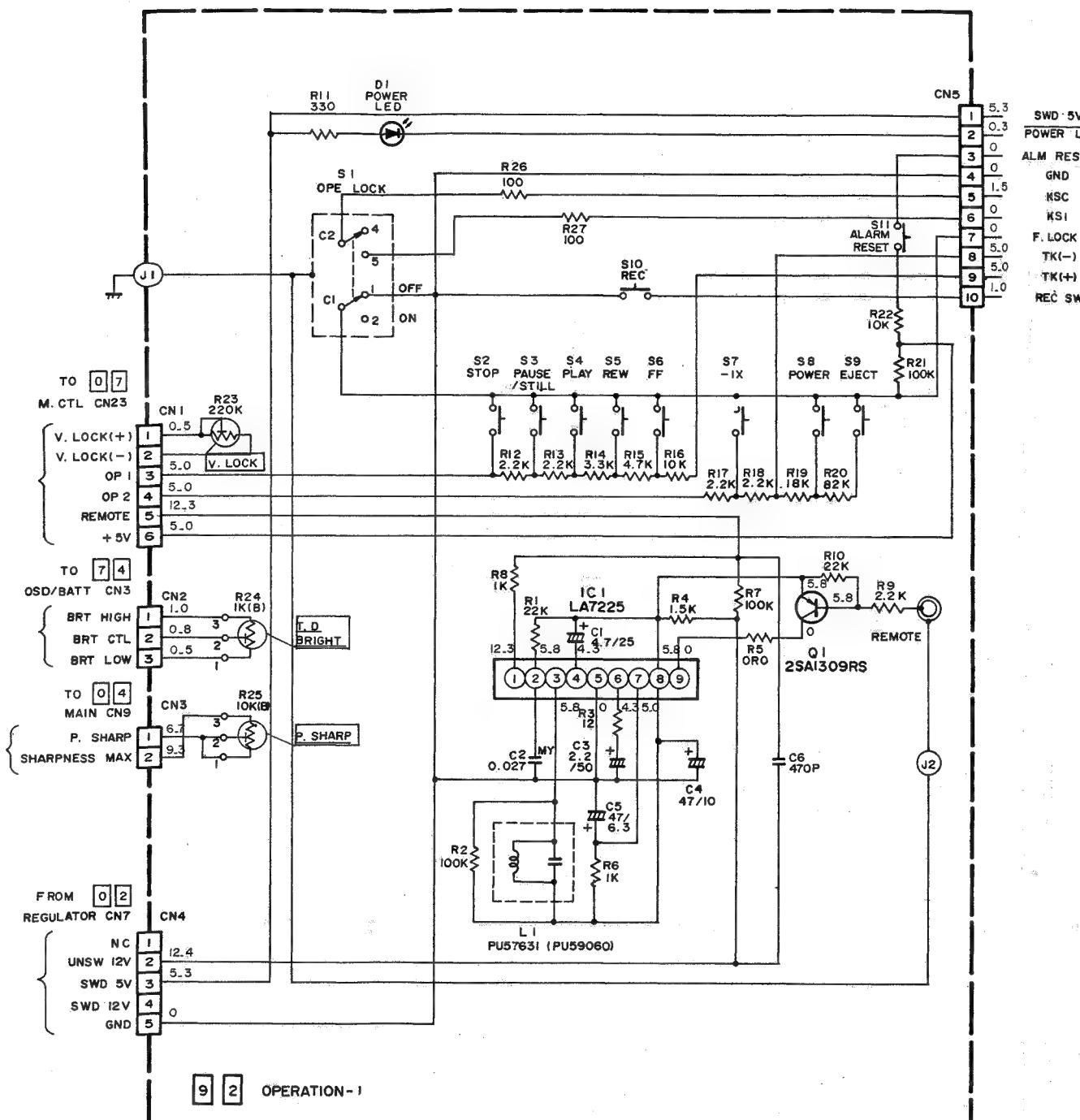
4.33 TIMER SCHEMATIC DIAGRAM



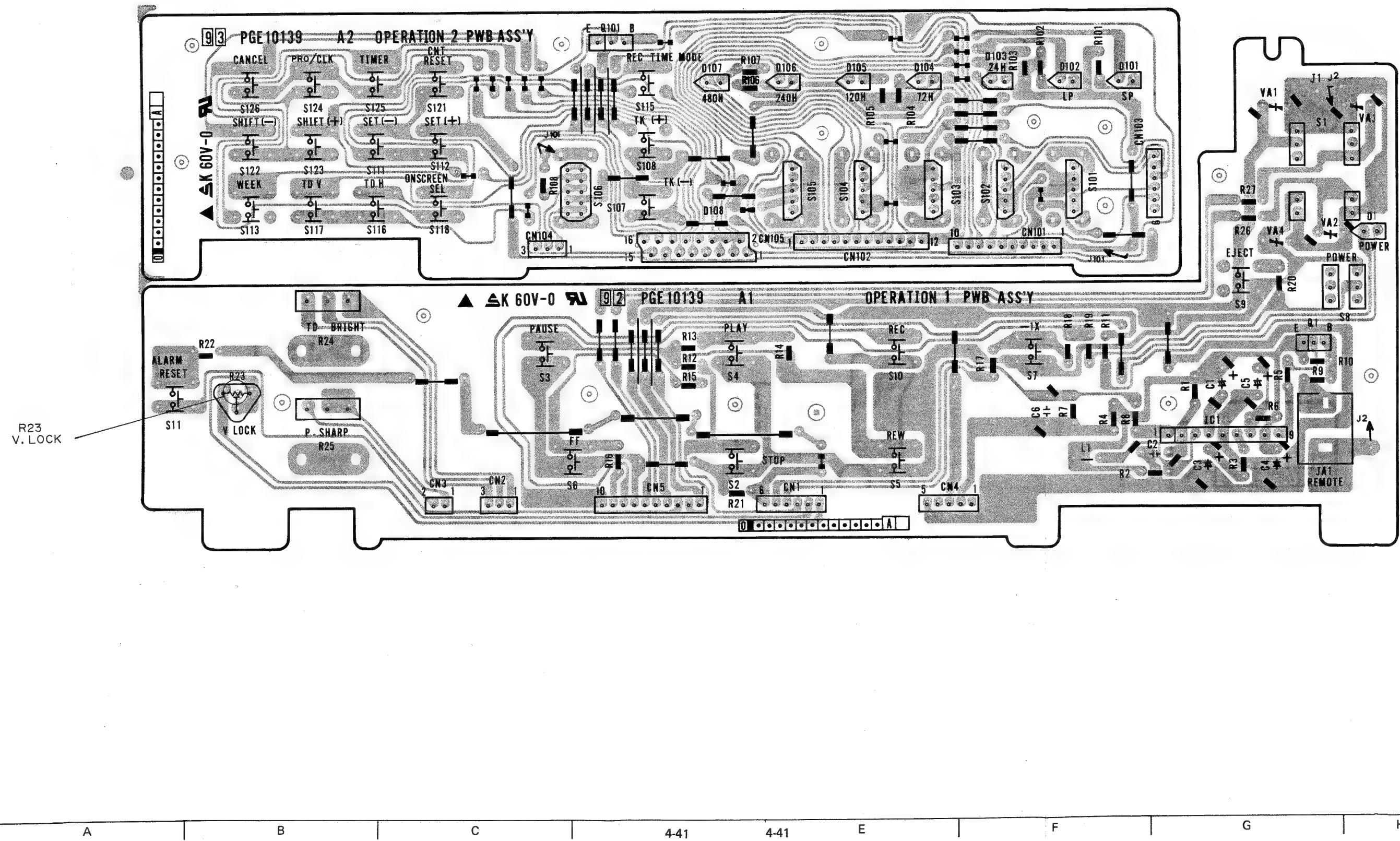
4.34 TIMER CIRCUIT BOARD



4.35 OPERATION SCHEMATIC DIAGRAM

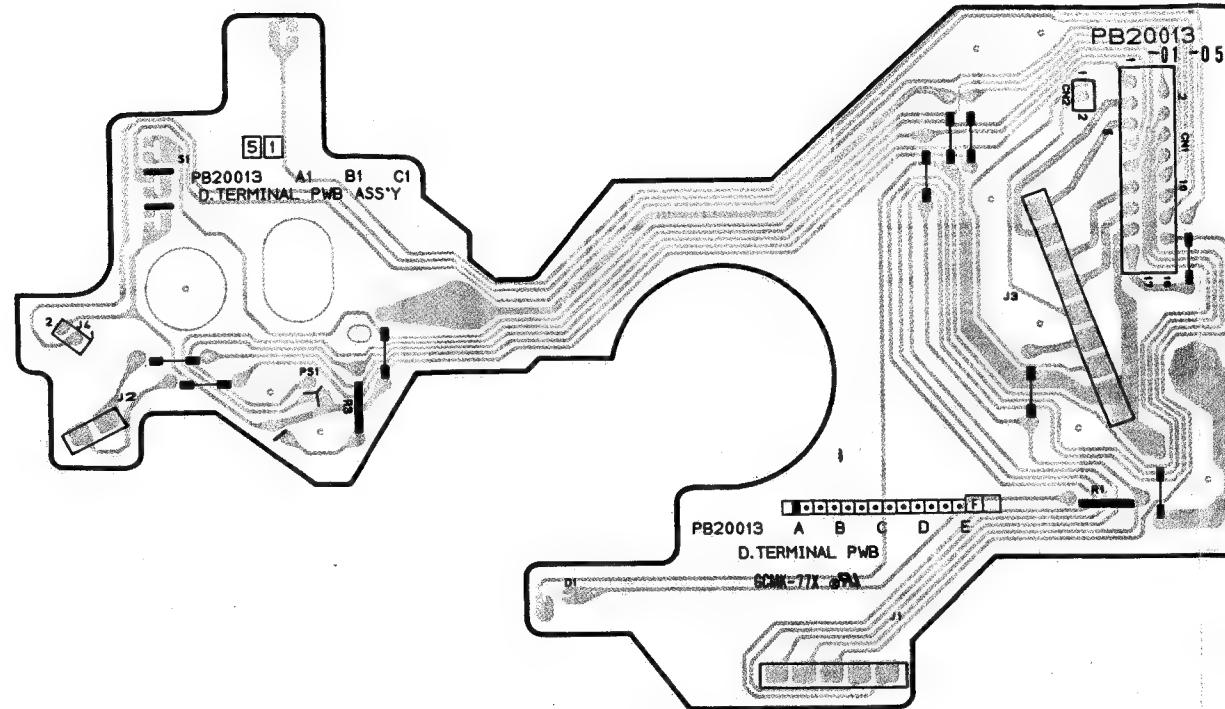


4.36 OPERATION CIRCUIT BOARD

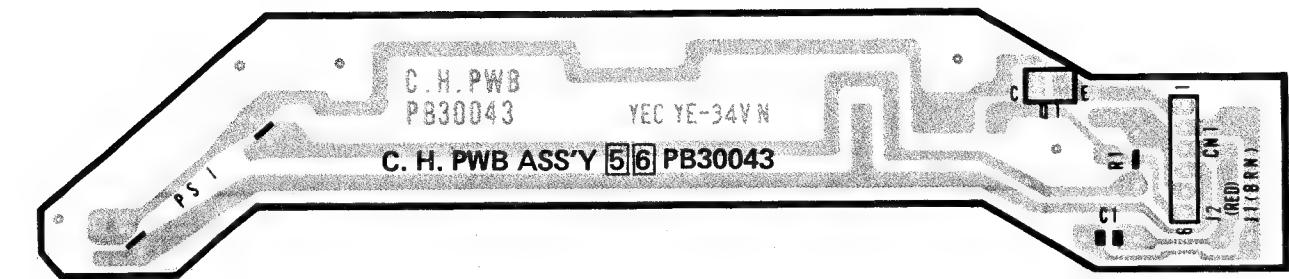


6 4.37 DECK TERMINAL CIRCUIT BOARD

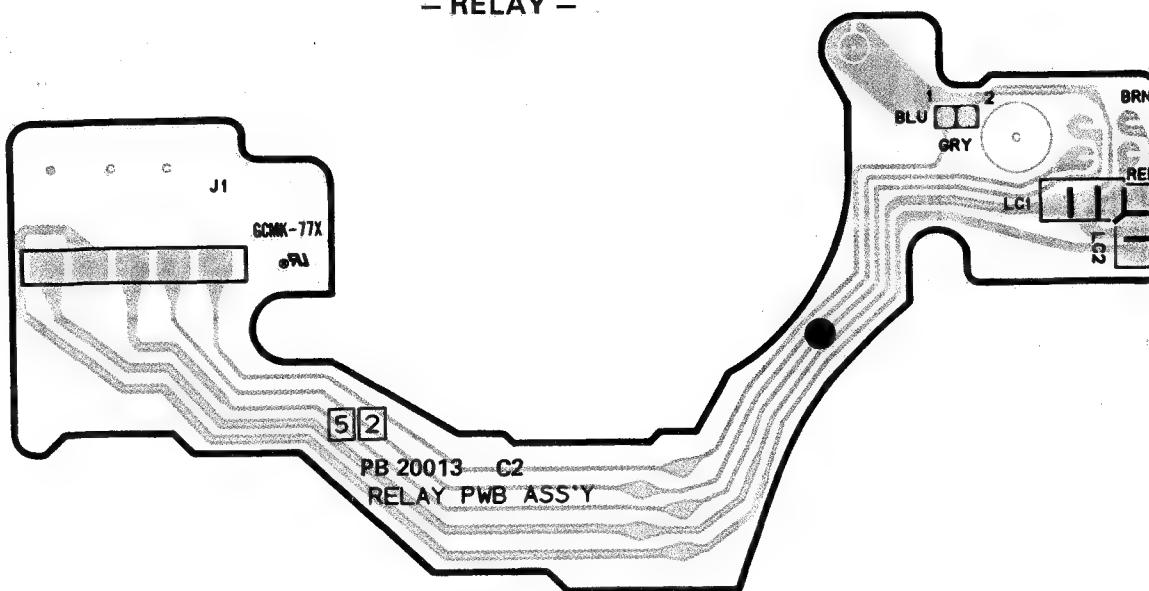
— DECK TERMINAL —



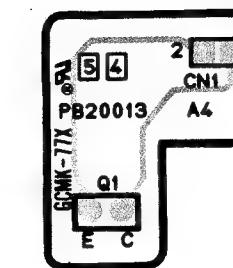
— CASSETTE HOUSING —



— RELAY —



— END SENSOR —

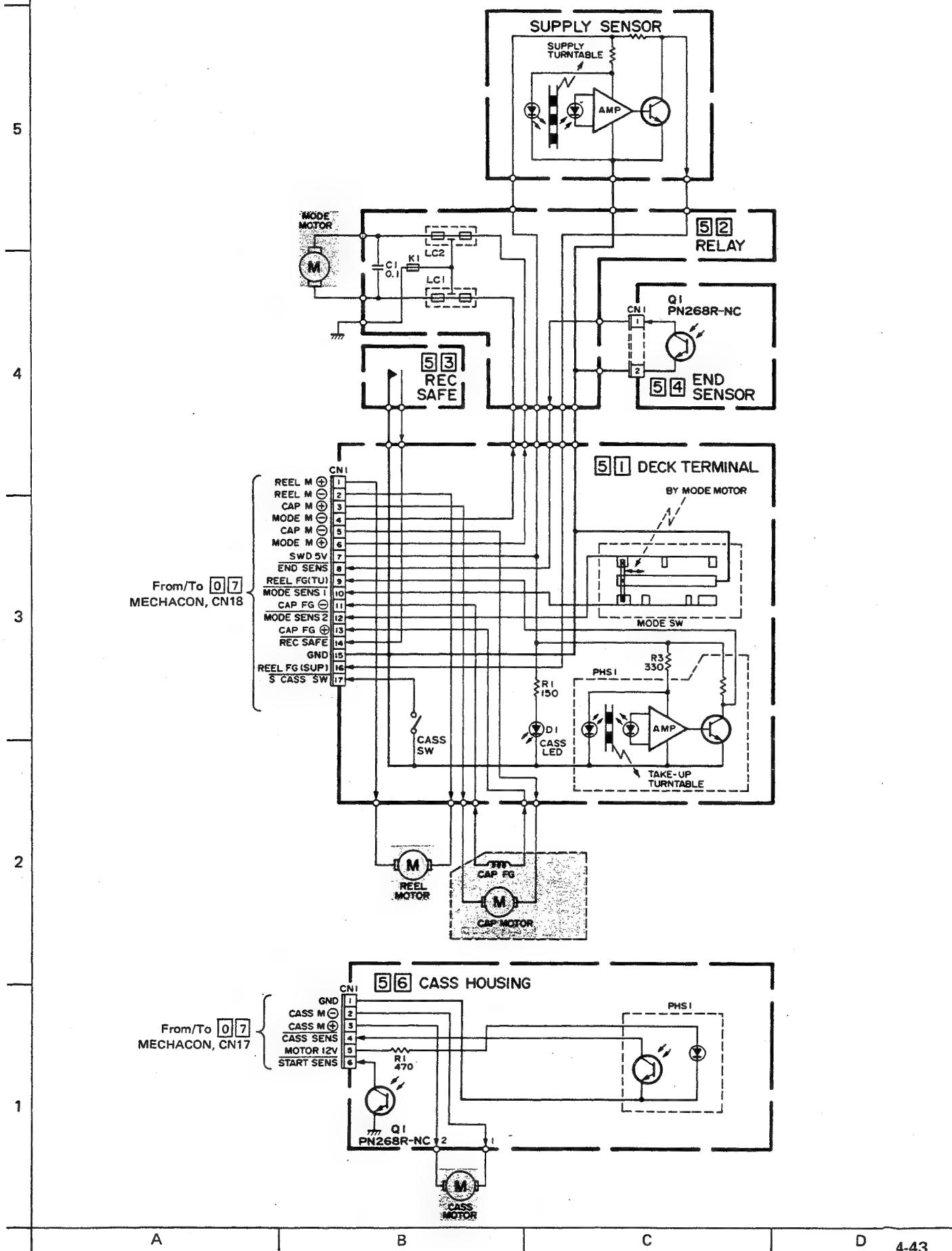


— REC SAFETY —



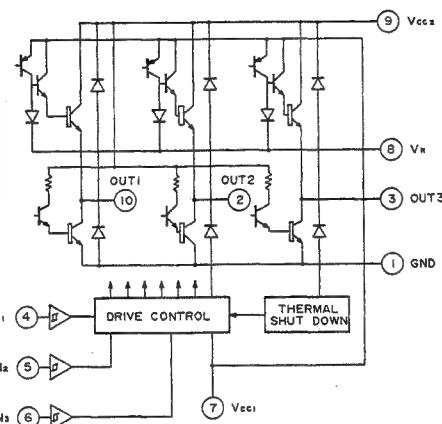
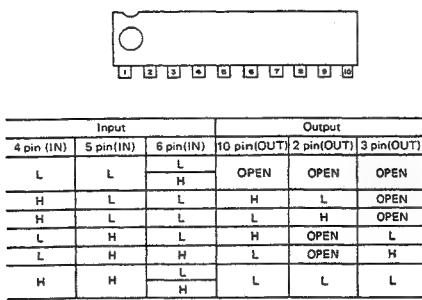
A B C D E F G H

4.38 DECK TERMINAL SCHEMATIC DIAGRAMS



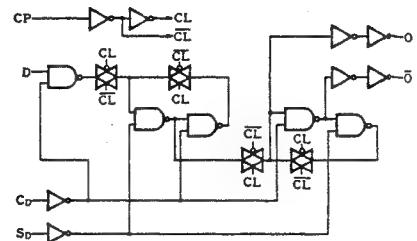
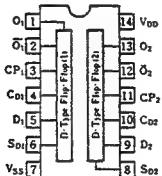
4.39 IC BLOCK DIAGRAMS

— BA6259 —

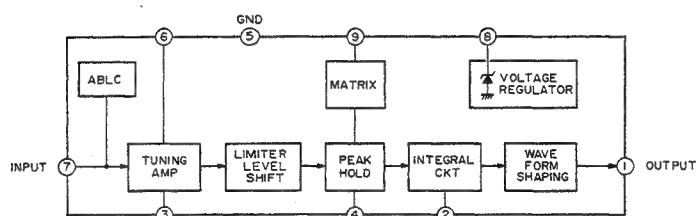
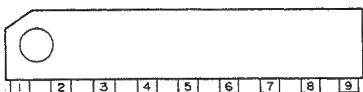


— BU4013B — — TC4013BP —

Dual D-type Flip-Flop



— LA7225 —

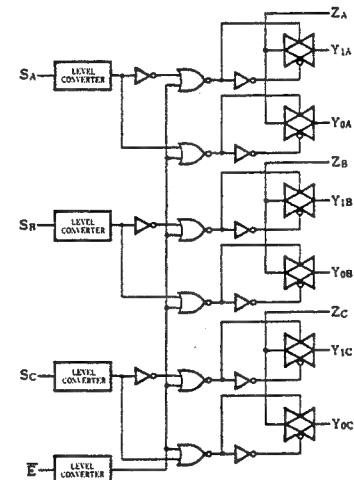
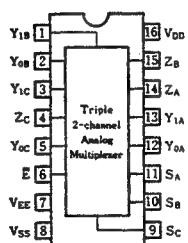


— MN4053B —

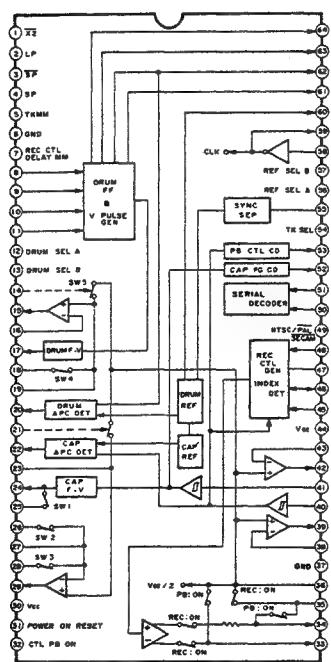
— TC4053BP —

— TC4053PS —

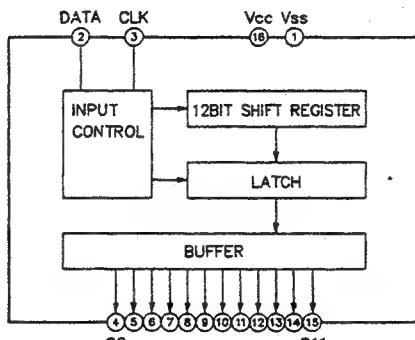
Type 2 Channel Analog Multiplexer



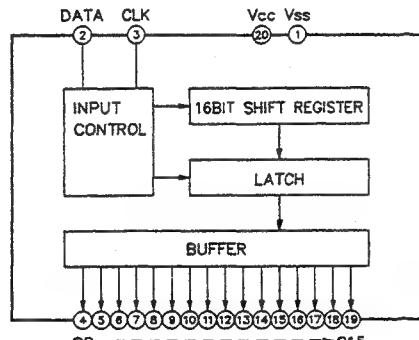
— HD49722NT — VTR Servo Control



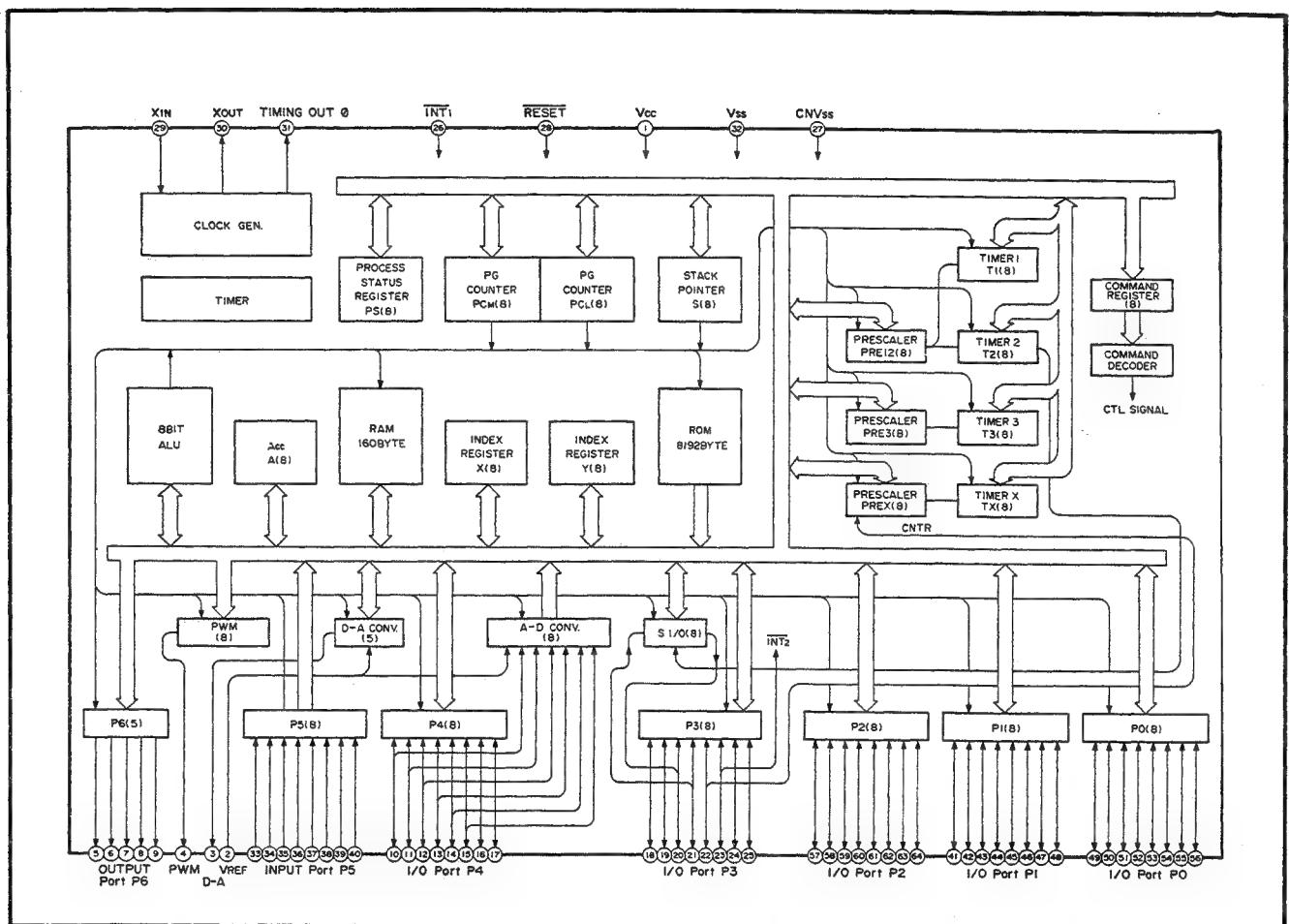
— M50253P — 12-bit serial data are parallel converted IC



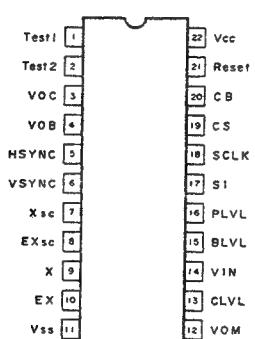
— M50255P — 16-bit serial data are parallel converted IC



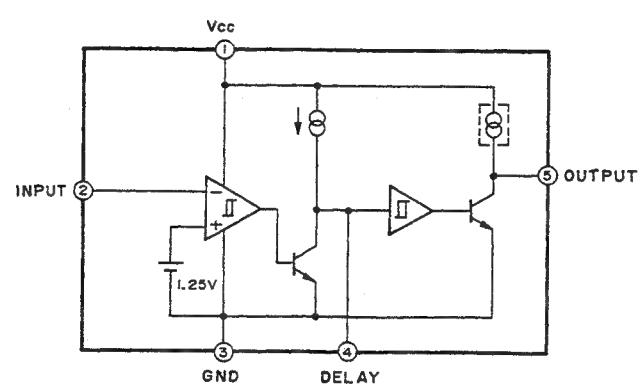
– M50938E-329SP –
Single Chip 8-bit Microprocessor



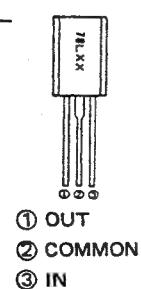
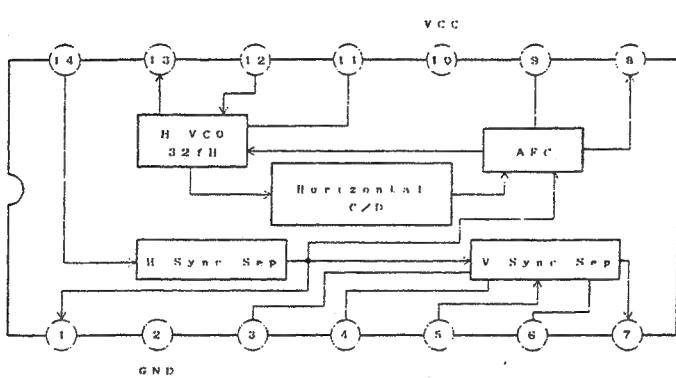
— M52684AP —



— M51957BL —

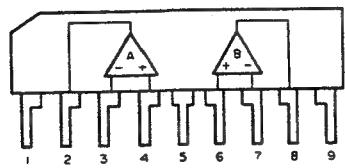


— M5278L56 —
Regulator



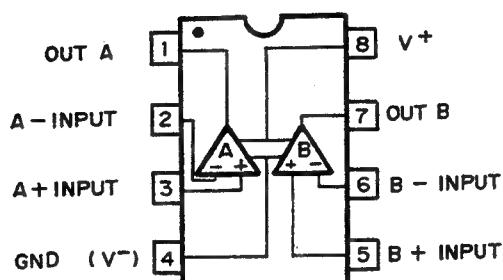
— NJM2903S —
Dual Compalator

— NJM2904S —
Dual Operation Amplifier

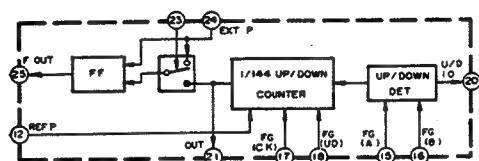


1. V⁺
2. A OUTPUT
3. A-INPUT
4. A+INPUT
5. V⁻
6. B+INPUT
7. B-INPUT
8. B OUTPUT
9. V⁺

— UPC393C —
Dual Comparator

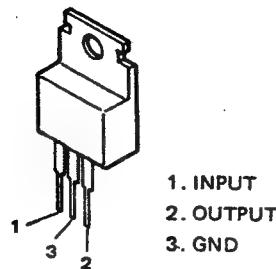


— VC2032 —



— TA78L005AP —
Regulator

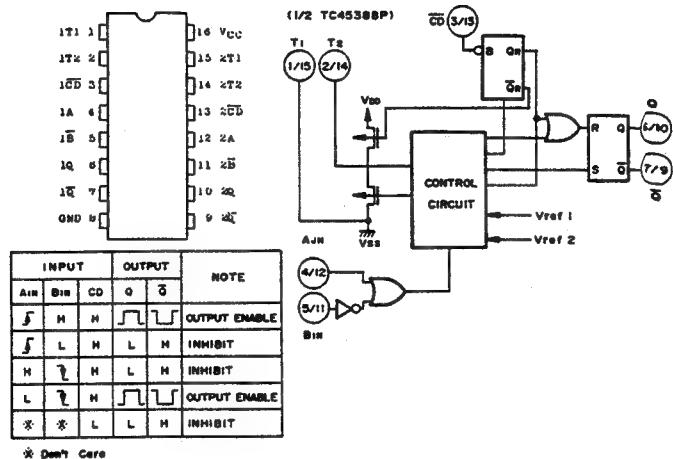
— TA78L009AP —
Regulator



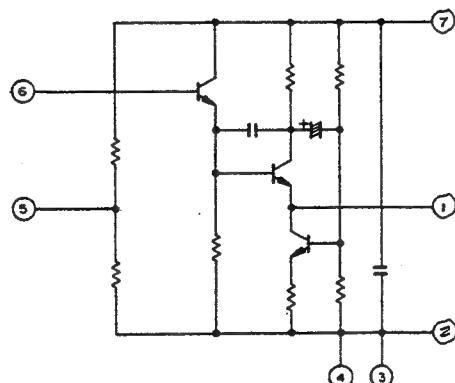
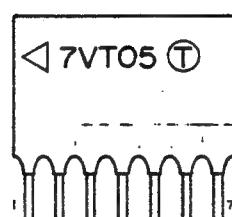
Pin1 IN
Pin2 OUT
Pin3 COMMON



— TC4538BP —
Dual Precision Retriggerable/Resettable Monostable Multivibrator



— 7VT05 —
Driver



SECTION 5

EXPLODED VIEWS AND PARTS LIST

SAFETY PRECAUTION

Parts identified by the  symbol are critical for safety.
Replace only with specified part numbers.

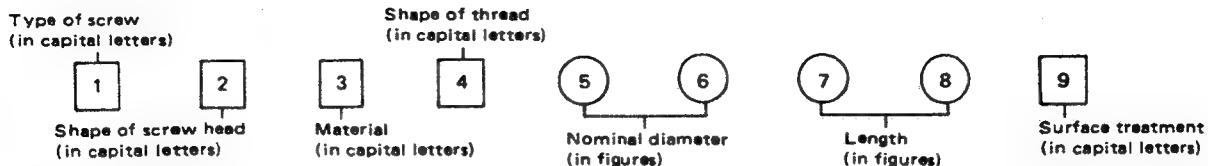
	Page
5.1 STANDARD PART NUMBER CODING	
5.1.1 Screw coding	5 - 2
5.1.2 Fuse coding	5 - 3
5.2 EXPLODED VIEWS AND PARTS LIST	
5.2.1 Packing assembly	5 - 3
5.2.2 Cabinet assembly	5 - 4
5.2.3 Chassis assembly	5 - 5
5.2.4 Mechanism (1) assembly	5 - 6
5.2.5 Mechanism (2) assembly	5 - 6

Note: " X " indicates quantity per set.

5.1 STANDARD PART NUMBER CODING

5.1.1 Screw coding

Standard screw part numbers are as follows.



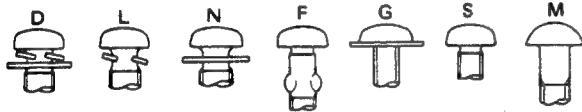
Type of screw (first digit)

- S Normal screws
- D Assembled machine screws (with plain and spring washers)
- L " (with spring washer)
- N " (with plain washer)
- F Feather screws
- G Washer head tapping screws
- M Wood screws

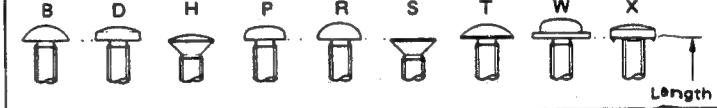
Shape of screw head (second digit)

- B Brazier head
- D Binding head
- H Oval countersunk head
- P Pan head
- R Round head
- S Flat head
- T Truss head
- W Washer head (machine screws)
- X Toothed head

—Type of screw (first digit) —



—Shape of screw head (second digit) —



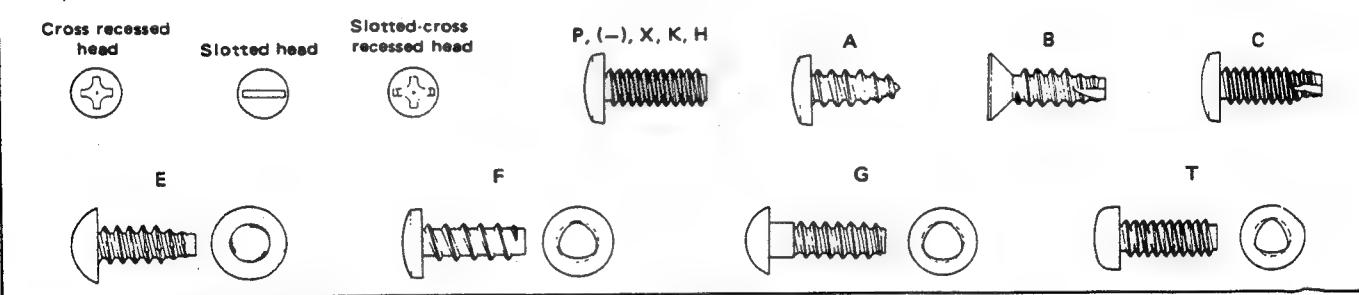
Material (third digit)

S Steel	N Nickel silver
E Stainless steel	Y Cast brass
C Cast iron	A Aluminum
U Copper	Z Zinc alloy
B Brass	K Polycarbonate
P Phosphor bronze	

Shape of thread (fourth digit)

- P Cross recessed head screws
- (-) Slotted head machine screws
- X Slotted-cross recessed head machine screws
- K Cross recessed head machine screws for precision equipment (type 1)
- H " (type 2)
- A Cross recessed head tapping screws (type 1)
- B " (type 2)
- C " (type 3)
- E Cross recessed head special tapping screws (brand: evertight)
- F " (brand: P-tight)
- T " (brand: taptight)
- G "

—Shape of thread (fourth digit) —



Nominal diameter (fifth and sixth digits)

The fifth and sixth digits are numbers indicating a nominal diameter or dimension. If the dimension exceeds 10 mm, three digits are used. The number indicates a nominal diameter or dimension, given in millimeters, multiplied by ten.

Surface treatment (ninth digit)

- Z Dichromate treatment after galvanizing (MFZn II-C)
- N Nickel plating (MFNi II, MFNi I)
- R Chromium plating (MBCr II, MBCr I)
- G Silver plating (SP4)
- B Black coating after plating
- F Blackening of iron (FB)
- M Blackening after galvanizing
- K Pickling of brass (PF2)
- P Phosphate treatment
- W Uni-chrome plating
- L Coating with transparent paint
- A Coloring red after galvanizing (MFZn II-C)
- C Coloring blue after galvanizing (MFZn II-C)
- T Coloring green after galvanizing (MFZn II-C)
- V Coloring purple after galvanizing (MFZn II-C)

Length (seventh and eighth digits)

The seventh and eighth digits are numbers indicating length in millimeters. The preceding figure is zero when the dimension is smaller than 10 mm. For machine screws used in precision equipment whose length is given in units of 0.1 mm, the number indicates ten times the size of their length.

# △	REF NO.	PART NO.	PART NAME, DESCRIPTION	# △	REF NO.	PART NO.	PART NAME, DESCRIPTION

* 4. MECHANISM ASSY <M4> *							
1	PQ43710A	TENSION ARM ASSY		61	PQ42001	WINDMILL	
1A	PQ41952-5	SPRING		62	PQ42002	CLUTCH SPRING	
2	PQ41948A	TENSION BAND ASSY		63	PQ42003	WORM SHAFT	
3	SDST2606Z	SCREW		64	PQM30017-5	SLIT WASHER, X2	
4	PQ43330C	FULL ERASE HEAD ASSY		65	PQM30003-20	BELT	
5	PU60646	FULL ERASE HEAD		66	PQM30018-22	SPACER	
6	PQ43299B	FULL ERASE HEAD SUB ASSY		67	PU61088	REEL SENSOR(S)	
7	PQ43837A	ROLLER ASSY		68	LPSP2604Z	ASSY SCREW	
8	PQ43836	RING		69	SPST2606Z	SCREW, X2	
9	PQM30017-25	SLIT WASHER		70	SPST2606Z	SCREW, X2	
10	LPSP2004Z	SCREW		71	LPSP2604Z	ASSY SCREW	
11	PQ41954-1-1	TORSION SPRING		72	PQ42038C	PLATE ASSY	
12	PQ41955	IMPEDANCE ROLLER		72A	PQ31044-1-2	LOCK LEVER	
13	PQ41956	COLLAR		72B	PQM30001-223	TENSION SPRING	
14	PQ41957	LOWER FLANGE		72C	PQM30001-211	TENSION SPRING	
OR	PQ42958	LOWER FLANGE		73	PQM30017-28	SLIT WASHER, X2	
15	PQM30018-39	SPACER		74	PQ42006B	PINCH ROLLER ARM ASSY	
OR	PQM30018-50	SPACER		75	PQM30017-28	SLIT WASHER	
16	PQM30002-124	COMPRESSION SPRING		76	Q03093-833	WASHER	
17	PQ40353	NYLON NUT		77	PQM30001-229	TENSION SPRING	
18	PU60560-2	AUDIO/CONTROL HEAD		78	PQ42013B-4	GUIDE ARM ASSY	
19	PQ42984-2	HEAD BASE		78A	PQ42029	SPRING	
20	PQ43687A	SCREW, X3		79	PQM30017-6	SLIT WASHER	
21	PU30080-49	SPRING, X3		80	PQ42019B-6	MAIN BRAKE ASSY (SUPPLY)	
22	DPSP2606Z	SCREW, X2		81	PQ42020B	MAIN BRAKE ASSY (TAKE-UP)	
23	PGZ01143	POLE BASE ASSY(TAKE-UP)		82	PQM30001-216	TENSION SPRING	
24	PU60556-1-2	POLE BASE ASSY(SUPPLY)		83	PQ42021A-3	SUB BRAKE ASSY (SUPPLY)	
25	PQM30017-5	SLIT WASHER, X2		83A	PQ42023-1-2	TENSION SPRING	
26	PU53629-3	TAPE GUIDE		84	PQ42037A-2	SUB BRAKE ASSY (TAKE-UP)	
27	PQ40268-2	GUIDE FLANGE		84A	PQ42028-1-1	TORSION SPRING	
28	PRD42612	GUIDE POLE CAP		85	PQM30017-6	SLIT WASHER	
29	SFSH2006Z	MINI SCREW		86	PU59925-1-1	LED HOLDER,INCLUDE LED	
△ 30	PGZ01300	CAPSTAN MOTOR		87	SPST2606Z	SCREW	
31	SPSP2605N	SCREW, X3		88	SPST2606Z	SCREW	
32	PRD42685A	HALF LOADING ARM ASSY		89	PU60444	SLIDE ENCODER	
33	PQM30017-29	SLIT WASHER		90	SDSP2610Z	SCREW	
34	PQ43295A-1	MOTOR BRAKE ASSY		91	PU59919-1-1	CASSETTE SWITCH	
34A	PQ43296	SPRING		92	SDST2608Z	SCREW	
35	PQ41974A-3	REEL MOTOR BRACKET ASSY		93	SDSP2606Z	SCREW, X3	
36	PU58645-1-4	IDLER ARM		94	SDST2606Z	SCREW	
37	Q03093-834	WASHER		95	PQ32776	CAP	
38	PQ41976A-1	SPRING ARM ASSY					
38A	PQ42212-1-4	SPRING					
39	PQM30017-22	SLIT WASHER					
40	PQ41978	HOLDER					
41	SPST2606Z	SCREW					
△ 42	PGZ01332	REEL MOTOR					
43	LPSP2604Z	ASSY SCREW, X2					
44	SPST2606Z	SCREW, X2					
45	PU59250-1-2	REEL DISK (SUPPLY)					
46	PQ20248H-20	MAIN DECK ASSY					
	PU58638-1-2	REEL DISK (TAKE-UP)					
47	PQM30017-5	SLIT WASHER, X2					
48	Q03093-828	WASHER, X2					
49	PQ41979A-5	LOADING ARM ASSY (SUPPLY)					
49A	PQ42677	TORSION SPRING (SUPPLY)					
50	PQ41985B-3	LOADING ARM ASSY (TAKE-UP)					
50A	PQ41990	TORSION SPRING (TAKE-UP)					
51	PQ42973A	CAM BRACKET ASSY					
52	PQ42974A	SLIDE CAM PLATE ASSY					
52A	PQM30001-224	SPRING					
53	PQ31677	HALF LOADING CAM					
54	PQ42963	SECOND GEAR					
55	PQM30017-24	SLIT WASHER, X2					
56	PQ41994A-3	ARM GEAR ASSY					
57	PQ20577	CONTROL CAM					
58	PQ41996B	MODE MOTOR ASSY					
OR	PQ41996C	MODE MOTOR ASSY					
59	PQ41998A	WORM ASSY					
60	LPSP2604Z	ASSY SCREW, X2					

SECTION 6

ELECTRICAL PARTS LIST

SAFETY PRECAUTION

Parts identified by the  symbol are critical for safety. Replace only with specified part numbers.

ABBREVIATIONS IN THIS LIST ARE AS FOLLOWS:

RESISTORS—All resistance values are in ohms (Ω), unless otherwise indicated.

k	: 1,000 (Kilo)
M	: 1,000,000 (Mega)
Chip R	: Chip Resistor
Chip VR	: Chip Variable Resistor
Comp. R	: Composition Resistor
CR	: Carbon Film Resistor
FR	: Fusible Resistor
MFR	: Metal Film Resistor
MPR	: Metal Plate Resistor
OMR	: Oxide Metal Film Resistor
PMR	: Precision Metal Film Resistor
UFR	: Unflammable Resistor
VR	: Variable Resistor (Potentiometer)
WR	: Wire Wound Resistor

CAPACITORS—All capacitance values are in $\mu\mu F$, unless otherwise indicated.

pF	: $\mu\mu F$ (Pico farad)
C Cap	: Ceramic Capacitor
Chip Cap	: Chip Capacitor
Chip T Cap	: Chip Tantalum Capacitor
E Cap	: Electrolytic Capacitor
FM Cap	: Film Mica Capacitor
LL Cap	: Low Leak Current Electrolytic Capacitor
MM Cap	: Metalized Mylar Capacitor
MP Cap	: Metalized Paper Capacitor
MY Cap	: Mylar Capacitor
NP Cap	: Non-polar Capacitor
PC Cap	: Polycarbonate Capacitor
PP Cap	: Polypropylene Capacitor
PS Cap	: Polystyrol Capacitor
T Cap	: Tantalum Capacitor
TF Cap	: Thin Film Capacitor
TR Cap	: Trimmer Capacitor

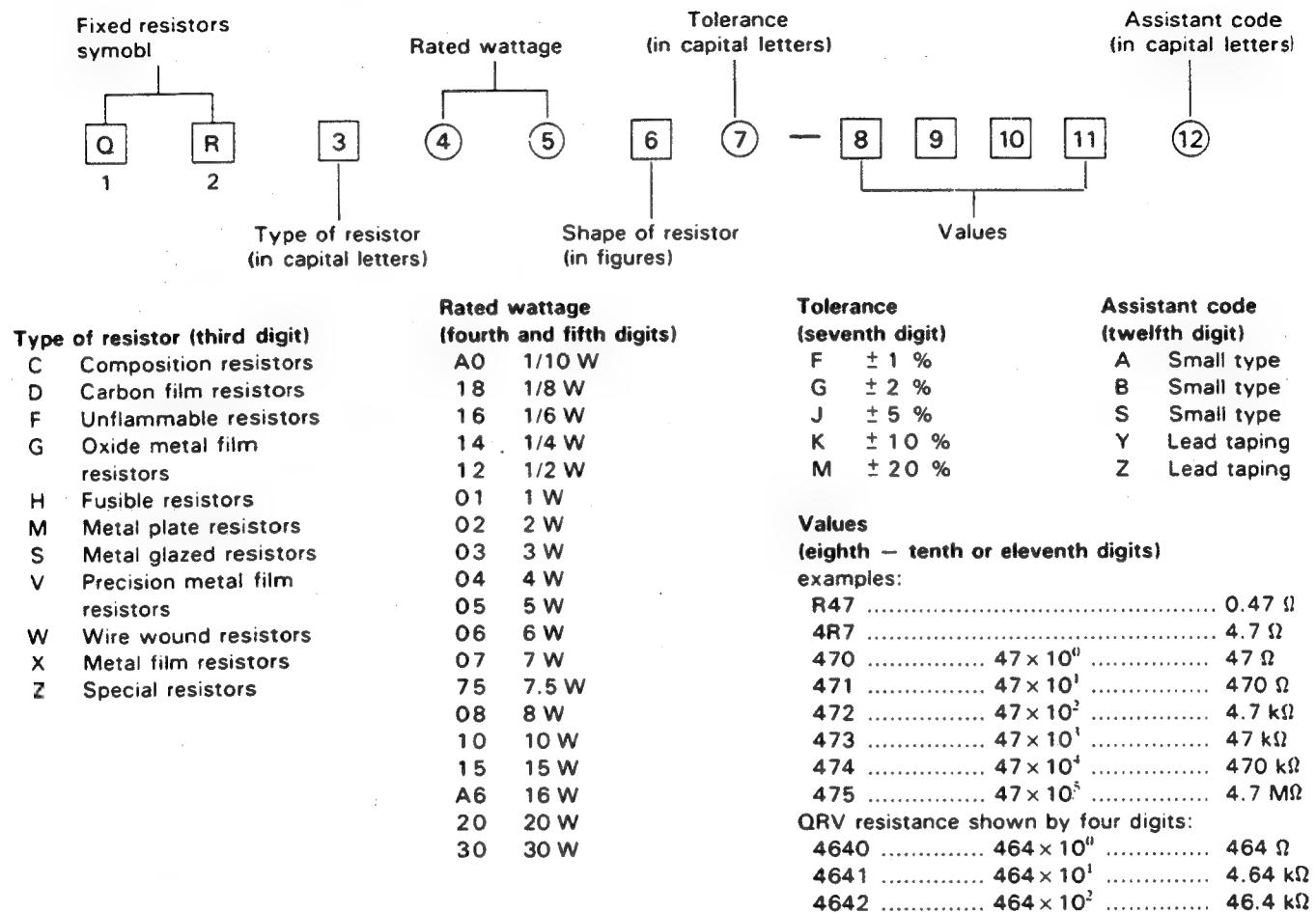
NOTES:

- [2 digits] indicates circuit board symbol number.
- "X" indicates quantity per set.
- Regarding electrical parts lists of board assemblies, the lists with asterisk (*) marks in the following table are common to the three units

6.1 STANDARD PART NUMBER CODING

6.1.1 Fixed resistor coding

Fixed resistor part numbers are as follows.



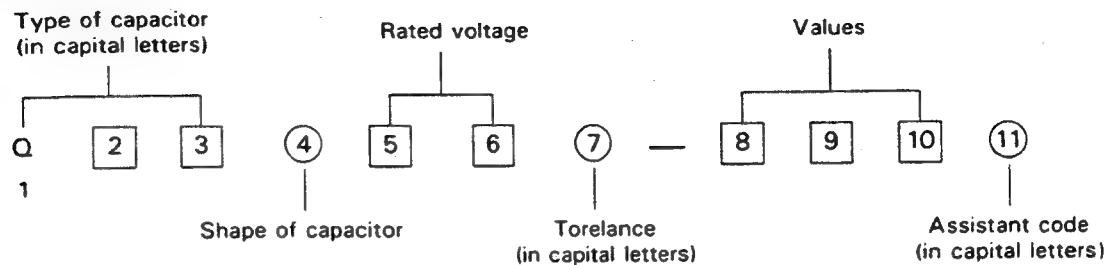
Shape of resistor (sixth digit)

Note: indicates flame retardant resistor.

Shape of resistor of resistor	C	D	F	G	H	M	S	V	W	X
1										
2										
3										
4										
5										
6										
7			Lug (B) type							
8			Lug (A) type							
9			Lug (C) type							

6.1.2 Fixed capacitor coding

Fixed capacitor part numbers are as follows.



Ceramic capacitors

Type of capacitor (first – third digits)		Shape of capacitor (fourth digit)				
Symbol	Characteristics	Mono-direction	Kink lead	Axial lead	Axial forming lead	Chip
QCC	Ceramic	1		4	5	
QCD	High capacitance					A
QCF	High capacitance	1,4	3			8,A
QCS	Temperature compensation	1	3	4	5	8,A
QCT	Temperature compensation		Special coding			8,A
QCV	Ceramic			1	3	
QCX	Ceramic			1	3	
QCY	High capacitance	1,4	3	6	7	8,A
QCZ	Special type		Special coding			
QCB	Ceramic			B	C	

Electrolytic capacitors

Type of capacitor (first-third digits)		Shape of capacitor (fourth digit)				
Symbol	Characteristics	Tubular	Mono-direction	Anti-stress	Forming	Snap-in
QEB	Low leakage		4	5	6	
QEC	Low leakage		4,8,A	9,8	6,C	
QEE	Tantalum (normal)		4	5	6	
	Tantalum (small)		8			
QEF	Chip tantalum		8 (chip type)			
QEG	Low impedance		4			
QEK	Miniature type		4	5	6	
QEL	Small type		4	5	6	7
QEM	Small type		4,A	5	6	
QEN	Non-polar	2	4	5	6	
QEP	Non-polar (small)		4,A	5,B	6,C	
QER	Miniature type		4	5	6	
QET	Small type	2	4,A	5,B	6,C	7
QEU	Small type		4	5	6	
QEV	Small type		4		6	7
QEW	Normal	2	4	5	6	7

Paper film capacitors

Type of capacitor (first – third digits)		Shape of capacitor (fourth digit)					
		Tubular	Normal		Flame retardant		
Symbol	Characteristics		Mono-direction	Kink lead	Mono-direction	Kink lead	
QFA	Metalized polypropylene				7		
QFE	Metalized mylar				5		
QFF	Film mica		4				
QFG	Polypropylene film		4	8			
QFH	Metalized mylar	2	4	3	5,7	6	
QFJ	Mylar (special)		4				
QFK	Metalized mylar (small)				5		
QFM	Mylar	2	4	3,7	5	6	
QFN	Mylar (small)		4	3			
QFP	Polypropylene		4	3,8			
QFS	Polystyrole	2	4	3			
QFV	Thin film		4	8			
QFZ	Special type		Special coding				

Rated voltage (fifth and sixth digits)

Sixth digit Fifth digit \	A	B	C	D	E	F	G	H	J	K	V	W	X
0						3.15	4.0		6.3				
1	10		16	20	25		40	50	63	80	35		
2	100	125	160	200	250	315	400	500	630		350	450	600
3	1000	1250		2000			5000						

Tolerance (seventh digit)

A	± 100 %	M	± 20 %
F	± 1 %	N	± 30 %
G	± 2 %	P	± 100 %
H	± 50 %	R	± 30 %
J	± 5 %	X	± 40 %
K	± 10 %	Z	± 80 %

Values (eighth – tenth digits)

Example : Values are in picofarads

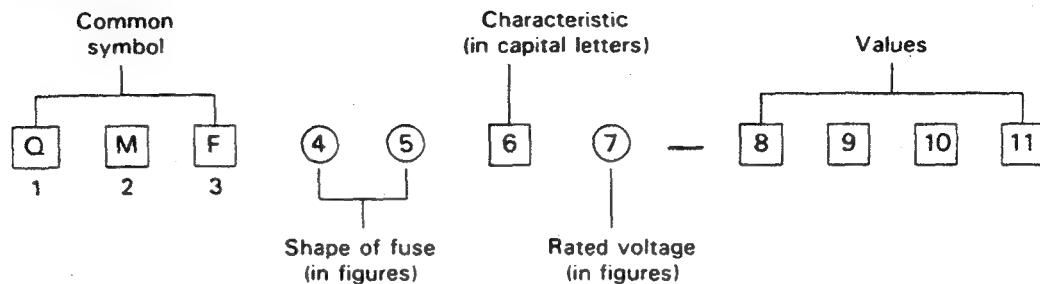
101	10×10^1 pF	100 pF
102	10×10^2 pF	1,000 pF (0.001 μ F)
103	10×10^3 pF	10,000 pF (0.01 μ F)
104	10×10^4 pF	100,000 pF (0.1 μ F)
105	10×10^5 pF	1 μ F
5R0		5.0 pF

Assistant code (eleventh digit)

G	Small size
Z	Lead taping
Y	Lead taping

6.1.3 Fuse coding

Standard fuse part numbers are as follows.



Shape of fuse (fourth and fifth digits)

51	φ5.2 × 20 mm
60	φ6.4 × 30 mm
61	φ6.35 × 31.8 mm
63	φ6.4 × 30 mm with lead wires
66	φ6.35 × 31.8 mm with lead wires
00	Special type

Rated voltage (seventh digit)

1	AC125 V
2	AC250 V
3	0.1–1 A : AC250 V 1.25–6.3 A : AC125 V

Values (eighth-tenth or eleventh digits)

example:
R63 0.63 A
1R0 1.0 A
2R5 2.5 A
100 10 A
R315 0.315 A
1R25 1.25 A

Characteristics (sixth digit)

Symbol	Fusing Current	Fusing Time	Remarks
A	210 %	Within 2 min.	Anti-rush type (for Europe)
	275 %	0.6 – 10 sec.	
	400 %	0.15 – 3 sec.	
	1000 %	0.02 – 0.3 sec.	
B	210 %	Within 30 min.	Regular fusible type (for SEMKO, Europe)
	275 %	0.05 – 2 sec.	
	400 %	0.01 – 0.3 sec.	
C	135 %	Within 1 hr.	Regular fusible type (for UL, Japan)
	200 %	Within 2 min.	
E	210 %	Within 2 min.	Anti-rush type (for Europe)
	275 %	0.6 – 10 sec.	
	400 %	0.15 – 3 sec.	
	1000 %	0.02 – 0.3 sec.	
J	135 %	Within 1 hr.	Anti-rush type
	200 %	Within 2 min.	
M	135 %	Within 1 hr.	Regular fusible type (for UL)
	200 %	Within 2 min.	
R	160 %	Within 1 hr.	Regular fusible type
	200 %	Within 2 min.	
S	160 %	Within 1 hr.	Anti-rush type
	200 %	Within 2 min.	
	700 % – 2000 %	Within 0.01 sec.	
U	135 %	Within 1 hr.	Anti-rush type (for UL)
	200 %	Within 2 min.	
	800 % – 2000 %	Within 0.01 sec.	

#	REF NO.	PART NO.	PART NAME, DESCRIPTION	#	REF NO.	PART NO.	PART NAME, DESCRIPTION

* 5. POWER SUPPLY BOARD ASSY<01><02> <01> *							

PWBA	PGE10144A		SWITCHING REGULATOR BOARD ASSY		R11	QRD161J-333	RESISTOR
△ STK1	PU44457		STICKER	△ C1	QFZ9022-683	MM CAPACITOR	
A01	PGZ00760		AC INLET	△ C7	QCZ9016-222M	CAPACITOR	
A02	PU52931		CONNECTOR COVER	△ OR	QCZ9048-222	CAPACITOR	
△ BKT1	PRD20225		TRANS BRACKET	△ C8	QCZ9016-222M	CAPACITOR	
△ ETH1	PRD42862-01-01		EARTH BRACKET	△ OR	QCZ9048-222	CAPACITOR	
△ HS1	PQ43230		HEAT SINK(2)	C9	QED61HM-226	E CAPACITOR	
SCW1	DPSP4008Z		ASSY SCREW	C10	QEZ0111-107	E CAPACITOR	
SCW2	DPSP3008Z		ASSY SCREW, X2	C11	QCY53AK-472	CAPACITOR	
SCW3	DPSP3012Z		SCREW, X2	C12	QCY43AK-121	CAPACITOR	
SCW4	SDST3006Z		SCREW, X3	C13	QFL41HJ-222	M CAPACITOR	
SCW5	SBSB3008Z		SCREW, X3	C14	QFV41HJ-474	TF CAPACITOR	
SCW6	SBSB3006Z		SCREW, X2	C15	QE20108-187Z	E CAPACITOR	
SCW7	LPSP4008Z		SCREW	△ C17	QCZ9016-102K	CAPACITOR	
SLD1	PQ32071		SHILD CASE(2)	△ OR	QCZ9047-102	CAPACITOR	
△ SPC1	PQ43773		SHEET(AC)	△ C18	QCZ9016-102K	CAPACITOR	
△ F1	QMF51E2-1R25		FUSE	△ OR	QCZ9047-102	CAPACITOR	
-SWITCHING P.S BOARD ASSY <01>-							
STK1	PRD42564-13		PWB LABEL	C31	QE20125-228	E CAPACITOR	
STK2	PRD42564-16		LABEL	C32	QE20106-338	E CAPACITOR	
PWBA1	PGE10144A1		SWITCHING BOARD ASSY	C33	QE20104-476Z	E CAPACITOR	
IC1	STR-D1706		IC	C34	QE20107-476Z	E CAPACITOR	
D1	10E6-F2		DIODE	C35	QETB1EM-108	E CAPACITOR	
D2	10E6-F2		DIODE	C36	QETB1EM-108	E CAPACITOR	
D3	10E6-F2		DIODE	C37	QETB1AM-108	E CAPACITOR	
D4	10E6-F2		DIODE	C38	QETC1JM-226	E CAPACITOR	
D5	RUIA		FR DIODE	C39	QETC1HM-226	E CAPACITOR	
D6	RUIA		FR DIODE	C40	QFL41HJ-102	M CAPACITOR	
D7	AU01Z		FR DIODE	C41	QFL41HJ-102	M CAPACITOR	
	OR ERA48-02		FR DIODE	L11	PU56183-330	COIL	
D8	AU01Z		FR DIODE	L12	PU56183-330	COIL	
	OR ERA48-02		FR DIODE	L13	PU56183-330	COIL	
△ D9	AU01Z		FR DIODE	L14	PU48530-101K	COIL	
△ D10	AU01Z		FR DIODE	L15	PU48530-101K	COIL	
D11	F6P20F		FR DIODE	L16	PU48530-8R2K	COIL	
	OR FML-12S		FR DIODE	L17	PU48530-8R2K	COIL	
D12	FSKQ40B		BARRIER DIODE	△ T1	PU60683	SWITCHING TRANSFORMER	
	OR FMB-24		BARRIER DIODE	△ HS1	PQ43231-1-1	HEAT SINK(3)	
D13	AU01Z		FR DIODE	HS2	PU60798	HEAT SINK	
	OR ERA48-02		FR DIODE	△ LF2	PU60347	LINE FILTER	
D14	AU01Z		FR DIODE	SLD1	PQ32558-1-1	SHIELD CASE(1)	
	OR ERA48-02		FR DIODE	CN1	PU58844-9	CAP HOUSING	
D15	RD16ES-T1B2		ZENER DIODE	CN2	PU58844-3	CAP HOUSING	
D28	AU01Z		FR DIODE	-REGULATOR BOARD ASSY<02>-			
R1	QRZ0078-2R2		WW RESISTOR	STK1	PRD42564-14	PWB LABEL	
R2	QRD181J-334		RESISTOR	PWBA2	PGE10144A2	REGULATOR BOARD ASSY	
R3	QRD181J-334		RESISTOR	IC2	BA10324	IC	
R4	QRG029J-104		OMF RESISTOR	IC3	MC7805ACT	IC	
R5	QRD161J-104		RESISTOR	IC101	M54647L	IC	
				Q11	2SD1764	TRANSISTOR	
					OR 2SD1796	TRANSISTOR	
				Q12	2SC1740S	TRANSISTOR	
				Q13	2SD1764	TRANSISTOR	
					OR 2SD1796	TRANSISTOR	
				Q14	2SD1764	TRANSISTOR	

#	REF NO.	PART NO.	PART NAME, DESCRIPTION	#	REF NO.	PART NO.	PART NAME, DESCRIPTION
	OR	2SD1796	TRANSISTOR		C52	QETC1HM-476	E CAPACITOR
Q15	OR	2SD1764	TRANSISTOR	C53	QETC1CM-107	E CAPACITOR	
	OR	2SD1796	TRANSISTOR	C54	QETC1HM-106	E CAPACITOR	
Q16		2SB1186(DE)	TRANSISTOR	C55	QFN31HJ-103	M CAPACITOR	
Q17		2SA720	TRANSISTOR	C56	QFN31HJ-103	M CAPACITOR	
Q18		DTA114ES	TRANSISTOR	C57	QETC1AM-107	E CAPACITOR	
D16	RD6.2ES-T1B3	ZENER DIODE		C58	QETC1HM-226	E CAPACITOR	
D17	RD5.1ES-T1B2	ZENER DIODE		C59	QETC1HM-226	E CAPACITOR	
D19	HZ6B1TE	DIODE		C60	QETC1HM-226	E CAPACITOR	
△	OR	HZ6B1TJ	DIODE	C101	QETC1EM-476	E CAPACITOR	
D20	RD13ES-T1B3	DIODE		C102	QETC1HM-105	E CAPACITOR	
D21	HZS33EB1	ZENER DIODE		L18	PU53618-101J	COIL	
D23	ISS133	DIODE		△	HD1	PU57505	FUSE CLIP, X2
D24	OR	MA165	DIODE	HS1	PQ43701-1-1	HEAT SINK	
D25	1SS133	DIODE		△	LF1	PU60020	LINE FILTER
D26	OR	MA165	DIODE	△	TAB1	A74316	TAB, X2
D27	1SS133	DIODE		TP1	PU55774	TEST PIN, X4	
D28	OR	MA165	DIODE	CN4	PU58844-102	CAP HOUSING	
D29	RD20ES-T1B2	ZENER DIODE		CN5	PU58844-102R	CAP HOUSING	
D30	OR	MT220BT-77	ZENER DIODE	CN6	PU58844-107	CAP HOUSING	
R14	QRD161J-222	RESISTOR		CN7	PU58844-105	CAP HOUSING	
R15	QRD161J-362	RESISTOR		CN8	PU58844-108	CAP HOUSING	
R16	QRD161J-472	RESISTOR		CN9	PU58844-103R	CAP HOUSING	
R17	QRD161J-102	RESISTOR		CN10	PU58844-103R	CAP HOUSING	
R18	QRD161J-622	RESISTOR		CN11	PU58844-103	CAP HOUSING	
R19	QRD161J-472	RESISTOR		CN12	PU58844-108	CAP HOUSING	
R20	QRD161J-102	RESISTOR		CN13	PU58844-103Y	CAP HOUSING	
R21	QRD161J-153	RESISTOR		△	CP1	ICP-F25	CIRCUIT PROTECTOR
R22	QRD161J-472	RESISTOR		△	CP2	ICP-F25	CIRCUIT PROTECTOR
R23	QRD161J-102	RESISTOR		△	CP3	ICP-F20	CIRCUIT PROTECTOR
R24	QRD161J-102	RESISTOR		△	CP4	ICP-F20	CIRCUIT PROTECTOR
R25	QRD161J-153	RESISTOR		△	CP101	ICP-F25	CIRCUIT PROTECTOR
R26	QVZ3521-222	V RESISTOR, SW 5V ADJ		*****	*****	*****	*****
R27	QRD161J-223	RESISTOR		*****	*****	*****	*****
R28	QRD161J-222	RESISTOR		*****	*****	*****	*****
R29	QRD161J-103	RESISTOR		*****	*****	*****	*****
R30	QRD161J-392	RESISTOR		*****	*****	*****	*****
R31	QRD161J-102	RESISTOR		*****	*****	*****	*****
R32	QRD161J-472	RESISTOR		*****	*****	*****	*****
R33	QRD161J-331	RESISTOR		*****	*****	*****	*****
R34	QRD161J-272	RESISTOR		*****	*****	*****	*****
△ R35	QRZ0077-220X	FUSIBLE RESISTOR		*****	*****	*****	*****
△ R36	QRZ0077-220X	FUSIBLE RESISTOR		*****	*****	*****	*****
R43	QRD161J-392	RESISTOR		PWBA	PRK10032A-01	MAIN BOARD ASSY	
R44	QRD181J-1R0	RESISTOR		B112	QRD161J-0R0	RESISTOR	
R45	QRD181J-1R0	RESISTOR		HN1	PU58018-1-2	PWB HINGE, X2	
R46	QRD181J-1R0	RESISTOR		SPC1	PU60010	SPACER, X4	
R47	QRD181J-1R0	RESISTOR		CN1	PU58844-3	CAP HOUSING	
R48	QRD181J-1R0	RESISTOR		CN2	PU58844-2	CAP HOUSING	
R49	QRD181J-1R0	RESISTOR		CN3	PU58844-4R	CAP HOUSING	
R50	QRD181J-1R0	RESISTOR		CN4	PU58844-5	CAP HOUSING	
R51	QRD181J-1R0	RESISTOR		CN5	PU58844-5	CAP HOUSING	
R52	QRD181J-562	RESISTOR		CN6	PU58844-4	CAP HOUSING	
R53	QRD181J-562	RESISTOR		CN7	PU58844-5	CAP HOUSING	
C43	QFN31HJ-103	M CAPACITOR		CN8	PU58844-2Y	CAP HOUSING	
C44	QETC1CM-107	E CAPACITOR		CN9	PU58844-2	CAP HOUSING	
C45	QETC1HM-106	E CAPACITOR		CN10	PU58844-2	CAP HOUSING	
C46	QFN31HJ-103	M CAPACITOR		CN11	PU58844-5Y	CAP HOUSING	
C47	QFN31HJ-103	M CAPACITOR		CN12	PU58844-8	CAP HOUSING	
C48	QETC1CM-107	E CAPACITOR		CN13	PU58844-4	CAP HOUSING	
C49	QFN31HJ-103	M CAPACITOR					
C50	QFN31HJ-103	M CAPACITOR					
C51	QETC1AM-107	E CAPACITOR					

#	REF NO.	PART NO.	PART NAME, DESCRIPTION	#	REF NO.	PART NO.	PART NAME, DESCRIPTION
	CN14	PU58844-4R	CAP HOUSING		Q56	DTA124ES	TRANSISTOR
	CN15	PU58844-4	CAP HOUSING		Q57	2SC1740S(QRS)	TRANSISTOR
	CN16	PU58844-3	CAP HOUSING		D1	ISS133	DIODE
	CN17	PU58844-6	CAP HOUSING		OR	MA165	DIODE
					D2	ISS133	DIODE
					OR	MA165	DIODE
					D3	ISS133	DIODE
					OR	MA165	DIODE
					D4	ISS133	DIODE
					OR	MA165	DIODE
					D5	ISS133	DIODE
					OR	MA165	DIODE
					D6	ISS133	DIODE
					OR	MA165	DIODE
					D7	ISS133	DIODE
					OR	MA165	DIODE
					D8	ISS133	DIODE
					OR	MA165	DIODE
					D10	ISS133	DIODE
					OR	MA165	DIODE
					D11	ISS133	DIODE
					OR	MA165	DIODE
					D12	ISS133	DIODE
					OR	MA165	DIODE
					D13	ISS133	DIODE
					OR	MA165	DIODE
					D20	QA90UF	DIODE
					D21	QA90UF	DIODE
					D22	ISS133	DIODE
					OR	MA165	DIODE
					D23	ISS133	DIODE
					OR	MA165	DIODE
					D24	ISS133	DIODE
					OR	MA165	DIODE
					D26	ISS133	DIODE
					OR	MA165	DIODE
					D27	ISS133	DIODE
					OR	MA165	DIODE
					D29	ISS133	DIODE
					OR	MA165	DIODE
					D31	ISS133	DIODE
					OR	MA165	DIODE
					D32	ISS133	DIODE
					OR	MA165	DIODE
					D34	RD9.1ES-T1B2	ZENER DIODE
					OR	ISS133	DIODE
					R1	QRD161J-562	RESISTOR
					R2	QRD161J-822	RESISTOR
					R4	QRD161J-182	RESISTOR
					R6	QRD161J-681	RESISTOR
					R7	QRD161J-223	RESISTOR
					R8	QRD161J-273	RESISTOR
					R9	QRD161J-223	RESISTOR
					R10	QRD161J-681	RESISTOR
					R11	QRD161J-331	RESISTOR
					R12	QRD161J-331	RESISTOR
					R13	QRD161J-475	RESISTOR
					R14	QRD161J-102	RESISTOR
					R17	QRD161J-821	RESISTOR
					R18	QRD161J-102	RESISTOR
					R19	QRD161J-222	RESISTOR
					R25	QRD161J-562	RESISTOR
					R26	QRD121J-181	RESISTOR
					R27	QVZ3518-102	V.R.0.25H DL VIDEO LEVEL
					R28	QRD161J-471	RESISTOR
					R29	QRD161J-821	RESISTOR

#	REF NO.	PART NO.	PART NAME, DESCRIPTION	#	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R30	QRD161J-561	RESISTOR		R109	QRD161J-223	RESISTOR
	R31	QRD161J-471	RESISTOR		R110	QVZ3518-473	V RESISTOR,2H DL CHROMA
	R32	QRD161J-153	RESISTOR		R111	QRD161J-223	RESISTOR
	R33	QRD161J-561	RESISTOR		R112	QRD161J-391	RESISTOR
	R34	QRD161J-182	RESISTOR		R113	QRD161J-391	RESISTOR
	R35	QRD161J-102	RESISTOR		R114	QRD161J-391	RESISTOR
	R36	QRD161J-221	RESISTOR		R115	QRD161J-391	RESISTOR
	R37	QRD161J-271	RESISTOR		R116	QRD161J-391	RESISTOR
	R38	QRD161J-471	RESISTOR		R117	QRD161J-223	RESISTOR
	R39	QRD161J-152	RESISTOR		R118	QVZ3520-223	V RESISTOR,Y COMB GAIN
	R40	QRD161J-152	RESISTOR		R119	QVZ3520-472	V RESISTOR,Y COMB PHASE
	R41	QRD161J-562	RESISTOR		R120	QRD161J-102	RESISTOR
	R42	QVZ3518-103	V.R,SHARPNESS PRESET		R122	QRD161J-102	RESISTOR
	R43	QRD161J-103	RESISTOR		R123	QRD161J-102	RESISTOR
	R45	QRD161J-331	RESISTOR		R124	QRD161J-102	RESISTOR
	R47	QRD161J-182	RESISTOR		R125	QRD161J-102	RESISTOR
	R48	QRD161J-391	RESISTOR		R126	QRD161J-102	RESISTOR
	R49	QRD161J-152	RESISTOR		R127	QRD161J-473	RESISTOR
	R50	QRD161J-102	RESISTOR		R128	QRD161J-562	RESISTOR
	R51	QRD161J-153	RESISTOR		R129	QRD161J-103	RESISTOR
	R52	QRD161J-683	RESISTOR		R130	QRD161J-393	RESISTOR
	R53	QRD161J-122	RESISTOR		R131	QRD161J-272	RESISTOR
	R55	QRD161J-102	RESISTOR		R133	QRD161J-224	RESISTOR
	R57	QRD167J-102	RESISTOR		R135	QRD161J-473	RESISTOR
	R58	QRD161J-0R0	RESISTOR		R136	QRD161J-393	RESISTOR
	R60	QRD161J-273	RESISTOR		R137	QRD161J-153	RESISTOR
	R61	QRD161J-223	RESISTOR		R138	QRD161J-561	RESISTOR
	R62	QRD161J-222	RESISTOR		R139	QRD161J-182	RESISTOR
	R63	QRD161J-102	RESISTOR		R140	QRD161J-271	RESISTOR
	R64	QRD161J-102	RESISTOR		R141	QRD161J-223	RESISTOR
	R65	QRD161J-152	RESISTOR		R142	QRD161J-392	RESISTOR
	R66	QRD161J-561	RESISTOR		R145	QRD161J-562	RESISTOR
	R67	QRD161J-821	RESISTOR		R146	QRD161J-682	RESISTOR
	R68	QRD161J-471	RESISTOR	▲	R147	QRD161J-680	RESISTOR
	R69	QRD161J-123	RESISTOR		R148	QRD161J-271	RESISTOR
	R70	QRD161J-473	RESISTOR		R149	QRD161J-101	RESISTOR
	R71	QRD161J-122	RESISTOR		R150	QRD161J-101	RESISTOR
	R72	QRD161J-102	RESISTOR		R151	QRD161J-393	RESISTOR
	R73	QRD161J-822	RESISTOR		R152	QRD161J-822	RESISTOR
	R74	QRD161J-182	RESISTOR		R153	QRD161J-122	RESISTOR
	R75	QVZ3518-102	V RESISTOR,EE Y LEVEL		R154	QRD161J-271	RESISTOR
	R76	QRD161J-272	RESISTOR		R155	QRD161J-222	RESISTOR
	R77	QRD161J-332	RESISTOR		R156	QRD161J-221	RESISTOR
	R78	QRD161J-183	RESISTOR		R157	QRD161J-221	RESISTOR
	R79	QRD161J-222	RESISTOR		R161	QRD161J-222	RESISTOR
	R80	QRD161J-681	RESISTOR		R163	QVZ3518-681	V.R,0.25H DL VIDEO LEVEL
	R81	QRD161J-223	RESISTOR		R164	QRD161J-102	RESISTOR
	R82	QRD161J-393	RESISTOR		R165	QRD161J-102	RESISTOR
	R83	QRD161J-153	RESISTOR		R166	QRD161J-151	RESISTOR
	R84	QRD161J-154	RESISTOR		R167	QRD161J-102	RESISTOR
	R85	QRD161J-124	RESISTOR		R168	QRD161J-102	RESISTOR
	R87	QRD161J-394	RESISTOR		R169	QRD161J-223	RESISTOR
	R88	QRD161J-475	RESISTOR		R170	QRD161J-153	RESISTOR
	R89	QRD161J-562	RESISTOR		R173	QRD161J-472	RESISTOR
	R91	QVZ3518-473	V RESISTOR,PB Y LEVEL		R175	QRD161J-331	RESISTOR
	R93	QRD161J-223	RESISTOR		R176	QRD161J-392	RESISTOR
	R94	QRD161J-182	RESISTOR		R177	ERT-02FHL332S	THERMISTOR
	R95	QVZ3518-222	V RESISTOR,C.REC FM LEVEL		R178	QRD161J-272	RESISTOR
	R96	QRD161J-122	RESISTOR		R179	QRD161J-223	RESISTOR
	R97	QRD161J-103	RESISTOR		R180	QRD161J-122	RESISTOR
	R98	QRD161J-223	RESISTOR		R181	QRD161J-562	RESISTOR
	R99	QRD161J-681	RESISTOR		R184	QRD161J-272	RESISTOR
	R105	QRD161J-331	RESISTOR		R185	QRD161J-471	RESISTOR
	R106	QRD161J-102	RESISTOR		R186	QRD161J-391	RESISTOR
	R107	QVZ3518-151	V RESISTOR,Y COMB LEVEL		R187	QRD161J-621	RESISTOR
	R108	QVZ3518-473	V RESISTOR,4H DL CHROMA		R188	QRD161J-392	RESISTOR

#	REF NO.	PART NO.	PART NAME, DESCRIPTION	#	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R189	QRD161J-181	RESISTOR		C49	QETC1CM-106	E CAPACITOR
	R190	QRD161J-821	RESISTOR		C50	QCVB1CN-103	CAPACITOR
	R191	QRD161J-222	RESISTOR		C51	QCSB1HJ-390	CAPACITOR
	R192	ERT-D2FGL102S	THERMISTOR		C52	QCVB1CN-103	CAPACITOR
	R193	QRD161J-473	RESISTOR		C53	QETC1CM-476	E CAPACITOR
	R194	QRD161J-473	RESISTOR		C54	QETC1CM-106	E CAPACITOR
	R195	QRD161J-561	RESISTOR		C55	QEK61CM-106	E CAPACITOR
	R196	QRD161J-561	RESISTOR		C56	QEK61CM-106	E CAPACITOR
	R197	QVZ3520-471	V RESISTOR, Y COMB ADJ		C57	QEK61CM-106	E CAPACITOR
	R198	QRD161J-103	RESISTOR		C58	QEK61CM-106	E CAPACITOR
	R199	QRD161J-121	RESISTOR		C60	QEK61CM-476	E CAPACITOR
	R200	QRD161J-102	RESISTOR		C61	QCVB1CN-103	CAPACITOR
	R201	QRD161J-332	RESISTOR		C62	QCSB1HJ-470	CAPACITOR
	R204	QRD161J-102	RESISTOR		C63	QCVB1CN-103	CAPACITOR
	R205	QRD161J-102	RESISTOR		C64	QCSB1HJ-220	CAPACITOR
▲	R206	QRD121J-680	RESISTOR		C65	QEK60JM-476	E CAPACITOR
	R209	QRD161J-474	RESISTOR		C66	QEK61CM-106	E CAPACITOR
	R210	QRD161J-101	RESISTOR		C67	QCVB1CN-103	CAPACITOR
	R211	QRD161J-101	RESISTOR		C68	QEK61CM-106	E CAPACITOR
	R212	QRD161J-122	RESISTOR		C74	QCSB1HJ-560	CAPACITOR
	R213	QRD161J-182	RESISTOR		C76	QETC0JM-476	E CAPACITOR
	R214	QVZ3518-222	V.R,B/W REC FM LEVEL		C84	QCSB1HJ-121	CAPACITOR
	R217	QRD161J-473	RESISTOR		C85	QCSB1HJ-560	CAPACITOR
	R218	QRD161J-103	RESISTOR		C86	QEK61CM-106	E CAPACITOR
	R219	QRD161J-821	RESISTOR		C87	QCSB1HJ-150	CAPACITOR
	R223	QRD161J-103	RESISTOR		C88	QEK61HM-225	E CAPACITOR
	R224	QRD161J-102	RESISTOR		C89	QEK61CM-106	E CAPACITOR
	R226	QRD161J-181	RESISTOR		C90	QEKS1CM-476	E CAPACITOR
	R227	QRD161J-561	RESISTOR		C91	QCVB1CN-103	CAPACITOR
	R229	QRD161J-0R0	RESISTOR		C92	QETC1CM-106	E CAPACITOR
	R230	QRD161J-102	RESISTOR		C93	QCSB1HJ-101	CAPACITOR
	R231	QRD161J-750	RESISTOR		C94	QCSB1HJ-270	CAPACITOR
C1	QCSB1HJ-560	CAPACITOR		C95	QCSB1HJ-180	CAPACITOR	
C2	QCSB1HJ-101	CAPACITOR		C96	QETC1HM-335	E CAPACITOR	
C3	QCSB1HJ-181	CAPACITOR		C97	QCSB1HJ-151	CAPACITOR	
C4	QETC1EM-475	E CAPACITOR		C98	QETC1HM-105	E CAPACITOR	
C5	QETC1HM-224	E CAPACITOR		C99	QE060JM-127	E CAPACITOR	
C6	QETC0JM-337	E CAPACITOR		C100	QCVB1CN-103	CAPACITOR	
C7	QCVB1CN-103	CAPACITOR		C101	QETC0JM-337	E CAPACITOR	
C8	QCSB1HJ-560	CAPACITOR		C102	QCSB1HJ-120	CAPACITOR	
C9	QEKS1HM-105	NP E CAPACITOR		C103	QCSB1HJ-560	CAPACITOR	
C10	QCVB1CN-103	CAPACITOR		C104	QCSB1HJ-560	CAPACITOR	
C11	QCSB1HJ-680	CAPACITOR		C105	QCVB1CN-103	CAPACITOR	
C13	QCVB1CN-103	CAPACITOR		C108	QCVB1CN-103	CAPACITOR	
C14	QETC1HM-225	E CAPACITOR		C109	QCSB1HJ-101	CAPACITOR	
C16	QCSB1HJ-181	CAPACITOR		C110	QCVB1CN-103	CAPACITOR	
C17	QCSB1HJ-391	CAPACITOR		C111	QETC0JM-476	E CAPACITOR	
C18	QETC1HM-225	E CAPACITOR		C112	QCVB1CN-103	CAPACITOR	
C19	QETC1CM-106	E CAPACITOR		C113	QCSB1HJ-101	CAPACITOR	
C25	QCVB1CN-103	CAPACITOR		C114	QCVB1CN-103	CAPACITOR	
C26	QCVB1CN-103	CAPACITOR		C115	QCVB1CN-103	CAPACITOR	
C27	QCVB1CN-103	CAPACITOR		C116	QCSB1HJ-101	CAPACITOR	
C29	QETC1EM-475	E CAPACITOR		C117	QCVB1CN-103	CAPACITOR	
C30	QCVB1CN-103	CAPACITOR		C118	QCVB1CN-103	CAPACITOR	
C31	QEK61EM-475	E CAPACITOR		C119	QCVB1CN-103	CAPACITOR	
C32	QEK61EM-475	E CAPACITOR		C120	QCVB1CN-103	CAPACITOR	
C33	QER61AM-226	E CAPACITOR		C121	QEK61CM-106	E CAPACITOR	
C34	QETC0JM-337	E CAPACITOR		C122	QCVB1CN-103	CAPACITOR	
C35	QCVB1CN-103	CAPACITOR		C123	QETC1HM-105	E CAPACITOR	
C36	QEKS1EM-475	NP E CAPACITOR		C124	QCVB1CN-103	CAPACITOR	
C37	QER61EM-475	E CAPACITOR		C125	QETC1CM-476	E CAPACITOR	
C38	QCVB1CN-103	CAPACITOR		C126	QEK61AM-476	E CAPACITOR	
C43	QEK61CM-106	E CAPACITOR		C127	QCVB1CN-103	CAPACITOR	
C44	QCVB1CN-103	CAPACITOR		C130	QETC0JM-476	E CAPACITOR	
				C131	QCVB1CN-103	CAPACITOR	

#	REF NO.	PART NO.	PART NAME, DESCRIPTION	#	REF NO.	PART NO.	PART NAME, DESCRIPTION
C132	QETC1AM-476	E CAPACITOR	C132	L11	PU48530-101K	COIL	
C133	QCVB1CN-103	CAPACITOR	C133	L12	PU48530-101K	COIL	
C134	QCVB1CN-103	CAPACITOR	C134	L13	PU59152-220J	COIL	
C135	QETC1CM-476	E CAPACITOR	C135	L14	PU48530-101K	COIL	
C136	QCVB1CN-103	CAPACITOR	C136	L15	PU48530-101K	COIL	
C137	QETC1CM-476	E CAPACITOR	C137	L16	PU59152-820J	COIL	
C138	QCVB1CN-103	CAPACITOR	C138	L19	PU48530-101K	COIL	
C139	QCVB1CN-103	CAPACITOR	C139	L20	PU48530-471K	COIL	
C140	QETC0JM-476	E CAPACITOR		L21	PU59152-150J	COIL	
C141	QCVB1CN-103	CAPACITOR	C141	L22	PU48530-101K	COIL	
C142	QEN61HM-105	NP E CAPACITOR	C142	L23	PU48530-471K	COIL	
C143	QETC1HM-104	E CAPACITOR	C143	L24	PU48530-560J	COIL	
C144	QCVB1CN-103	CAPACITOR	C144	L25	PU48530-471J	COIL	
C146	QCSB1HJ-220	CAPACITOR	C146	L26	PU59152-121J	COIL	
C147	QCBB1HJ-101	CAPACITOR	C147	L27	PU48530-101K	COIL	
C148	QCVB1CN-103	CAPACITOR	C148	L28	PU48530-101K	COIL	
C149	QCSB1HJ-560	CAPACITOR	C149	L29	PU48530-101K	COIL	
C150	QCSB1HJ-390	CAPACITOR	C150	L30	PU60165-8R2G	COIL	
C151	QCVB1CN-103	CAPACITOR	C151	L31	PU60165-8R2G	COIL	
C152	QEK61CM-336	E CAPACITOR	C152	L32	PU48530-101K	COIL	
C153	QCSB1HK-5R6	CAPACITOR	C153	L33	PU59152-180J	COIL	
C154	QCSB1HJ-390	CAPACITOR	C154	L35	PU59152-1R0K	COIL	
C155	QCSB1HJ-120	CAPACITOR	C155	L36	PU59152-1R0K	COIL	
C156	QCSB1HJ-100	CAPACITOR	C156	L38	PU59152-5R6J	COIL	
C159	QCVB1CN-103	CAPACITOR	C159	L39	PU48530-101K	COIL	
C160	QCBB1HJ-151	CAPACITOR	C160	L40	PU59152-820J	COIL	
C165	QEK61CM-476	E CAPACITOR	C165	L41	PU59152-101J	COIL	
C166	QCVB1CN-103	CAPACITOR	C166	L43	PU48530-101K	COIL	
C167	QETC1CM-107	E CAPACITOR	C167	L44	PU59152-151J	COIL	
C168	QCVB1CN-103	CAPACITOR	C168	L46	PU48530-101K	COIL	
C169	QETC1CM-106	E CAPACITOR	C169	L47	PU48530-470J	COIL	
C171	QCVB1CN-103	CAPACITOR	C171	EQ1	PU60099	EQUALIZER	
C172	QCVB1CN-103	CAPACITOR	C172	EQ2	PU60809	EQUALIZER	
C173	QCT25CH-470	CAPACITOR	C173	EQ3	PU60810	EQUALIZER	
C174	QCBB1HJ-471	CAPACITOR	C174	LPF2	PGZ00183	LOW PASS FILTER	
C175	QCC31CJ-563	CAPACITOR	C175	LPF3	PU60806-2	LOW PASS FILTER	
C178	QCVC1CN-103	CAPACITOR	C178	BPF2	PU60921	BAND PASS FILTER	
C179	QCSB1HJ-470	CAPACITOR	C179	BPF3	PU60808-2	BAND PASS FILTER	
C180	QCSB1HJ-220	CAPACITOR	C180	DL1	PU60815	2H DELAY LINE	
C183	QCSB1HJ-390	CAPACITOR	C183	DL3	PU61081	1/4H DELAY LINE	
C184	QCVB1CN-103	CAPACITOR	C184	△ X101	PU60438	CRYSTAL RESONATOR	
C185	QCSB1HK-3R9	CAPACITOR	C185	T1	PU60814	COIL,4H DLY'D CHROMA	
C190	QCVB1CN-103	CAPACITOR	C190	T2	PU60814	COIL,2H DLY'D CHROMA	
C191	QEK61CM-476	E CAPACITOR	C191	-VIDEO C SECTION-			
C192	QETC1CM-106	E CAPACITOR	C192	IC301	PB20287A-03	C.MOD.(JA056-01)	
C193	QETC1CM-106	E CAPACITOR	C193	IC302	PB20289A-02	JOG MOD.(JA058)	
C194	QETC1CM-106	E CAPACITOR	C194	IC303	NJM2233AD	IC	
C196	QER41CM-476	E CAPACITOR	C196	Q301	2SA933S	TRANSISTOR	
C197	PU54990-3	E CAPACITOR	C197	Q302	DTC144WS	TRANSISTOR	
C198	PU54990-3	E CAPACITOR	C198	Q303	DTA124ES	TRANSISTOR	
C199	QCVB1CN-103	CAPACITOR	C199	Q304	2SC1740S(QRS)	TRANSISTOR	
C200	QCVB1CN-103	CAPACITOR	C200	Q305	2SC1740S(QRS)	TRANSISTOR	
C201	QCVB1CN-103	CAPACITOR	C201	Q307	2SC2021Q,R,S	TRANSISTOR	
C203	QER61EM-335	E CAPACITOR	C203	Q308	2SA937	TRANSISTOR	
C204	QCZ0208-104	MC CAPACITOR	C204	Q309	2SC1740S(QRS)	TRANSISTOR	
C206	QCS11HJ-150	CAPACITOR	C206	Q310	DTC124ES	TRANSISTOR	
C207	QCZ0208-104	MC CAPACITOR	C207	Q311	2SC1740S(QRS)	TRANSISTOR	
L1	PU59152-220J	COIL	L1	Q312	DTC114ES	TRANSISTOR	
L2	PU48530-101K	COIL	L2	Q313	DTC114ES	TRANSISTOR	
L4	PU48530-101K	COIL	L4	Q314	DTC144WS	TRANSISTOR	
L6	PU48530-101K	COIL	L6	Q315	2SC1740S(QRS)	TRANSISTOR	
L7	PU48530-101K	COIL	L7				
L8	PU48530-101K	COIL	L8				
L9	PU48530-101K	COIL	L9				
L10	PU48530-101K	COIL	L10				

#	REF NO.	PART NO.	PART NAME, DESCRIPTION	#	REF NO.	PART NO.	PART NAME, DESCRIPTION
	Q316	2SA933S	TRANSISTOR		R337	QRD161J-333	RESISTOR
	Q317	2SC1740S(QRS)	TRANSISTOR		R338	QRD161J-333	RESISTOR
	Q318	2SC1740S(QRS)	TRANSISTOR		R339	QRD161J-151	RESISTOR
	Q319	2SC1740S(QRS)	TRANSISTOR		R340	QRD161J-272	RESISTOR
	Q323	DTC124ES	TRANSISTOR		R341	QRD161J-391	RESISTOR
	Q324	DTC124ES	TRANSISTOR		R342	QRD161J-561	RESISTOR
	Q326	2SA933S	TRANSISTOR		R343	QRD161J-393	RESISTOR
	Q327	2SA933S(QRS)	TRANSISTOR		R344	QRD161J-332	RESISTOR
	Q331	DTC124ES	TRANSISTOR		R345	QRD161J-472	RESISTOR
	D301	ISS133	DIODE		R346	QRD161J-103	RESISTOR
	OR	MA165	DIODE		R347	QRD161J-473	RESISTOR
	D302	ISS133	DIODE		R349	QRD161J-122	RESISTOR
	OR	MA165	DIODE		R350	QRD161J-471	RESISTOR
	D311	ISS133	DIODE		R351	QRD161J-102	RESISTOR
	OR	MA165	DIODE		R352	QRD161J-102	RESISTOR
	D312	ISS133	DIODE		R353	QVZ3518-222	V.R.PAL LP REC COLOR
	OR	MA165	DIODE		R355	QVZ3518-222	V.R.PAL SP REC COLOR
	D313	ISS133	DIODE		R357	QRD161J-333	RESISTOR
	OR	MA165	DIODE		R358	QRD161J-223	RESISTOR
	D314	ISS133	DIODE		R359	QRD161J-223	RESISTOR
	OR	MA165	DIODE		R360	QRD161J-102	RESISTOR
	D315	ISS133	DIODE		R361	QRD161J-332	RESISTOR
	OR	MA165	DIODE		R362	QRD161J-103	RESISTOR
	D323	ISS133	DIODE		R363	QRD161J-103	RESISTOR
	OR	MA165	DIODE		R364	QRD161J-223	RESISTOR
	D324	ISS133	DIODE		R366	QRD161J-103	RESISTOR
	OR	MA165	DIODE		R367	QRD161J-473	RESISTOR
	D325	ISS133	DIODE		R368	QRD161J-332	RESISTOR
	OR	MA165	DIODE		R371	QRD161J-102	RESISTOR
	D326	ISS133	DIODE		R372	QRD161J-102	RESISTOR
	OR	MA165	DIODE		C301	QETC1HM-105	E CAPACITOR
	D327	ISS133	DIODE		C302	QETC1HM-105	E CAPACITOR
	OR	MA165	DIODE		C303	QCC31CJ-223	CAPACITOR
	R302	QRD161J-102	RESISTOR		C304	QETC0JM-107	E CAPACITOR
	R303	QRD161J-102	RESISTOR		C305	QETC1HM-105	E CAPACITOR
	R304	QRD161J-102	RESISTOR		C307	QCSB1HJ-330	CAPACITOR
	R305	QRD161J-102	RESISTOR		C308	QCSB1HJ-390	CAPACITOR
	R307	QRD161J-225	RESISTOR		C309	QFN41HJ-473	M CAPACITOR
	R308	QRD161J-103	RESISTOR		C310	QCSB1HJ-560	CAPACITOR
	R309	QRD161J-102	RESISTOR		C311	QEK60JM-476	E CAPACITOR
	R310	QRD161J-222	RESISTOR		C312	QCVB1CN-103	CAPACITOR
	R311	QRD161J-222	RESISTOR		C314	QCBB1HJ-820	CAPACITOR
	R312	QRD161J-561	RESISTOR		C315	QCC31CK-682	CAPACITOR
	R313	QRD161J-561	RESISTOR		C316	QCVB1CN-103	CAPACITOR
	R314	QRD161J-103	RESISTOR		C317	QCXB1CN-222	CAPACITOR
	R315	QRD161J-471	RESISTOR		C318	QCBB1HJ-820	CAPACITOR
	R316	QRD161J-223	RESISTOR		C320	QCVB1CN-103	CAPACITOR
	R319	QRD161J-102	RESISTOR		C321	QETC1HM-105	E CAPACITOR
	R320	QRD161J-102	RESISTOR		C322	QETC1HM-104	E CAPACITOR
	R321	QRD161J-561	RESISTOR		C323	QEK61EM-475	E CAPACITOR
	R322	QRD161J-471	RESISTOR		C324	QCC31CK-104	CAPACITOR
	R323	QRD161J-272	RESISTOR		C325	QETC0JM-337	E CAPACITOR
	R324	QRD161J-391	RESISTOR		C326	QCC31CK-563	CAPACITOR
	R325	QRD161J-223	RESISTOR		C327	QETC0JM-107	E CAPACITOR
	R326	QRD161J-561	RESISTOR		C328	QETC1EM-335	E CAPACITOR
	R327	QRD161J-333	RESISTOR		C329	QETC0JM-337	E CAPACITOR
	R328	QRD161J-102	RESISTOR		C330	QETB1HM-474	E CAPACITOR
	R329	QRD161J-222	RESISTOR		C331	QETC1HM-474	E CAPACITOR
	R330	QRD161J-561	RESISTOR		C332	QETC1HM-474	E CAPACITOR
	R331	QRD161J-561	RESISTOR		C333	QEK61HM-474	E CAPACITOR
	R332	QRD161J-393	RESISTOR		C334	QETC1HM-474	E CAPACITOR
	R333	QRD161J-223	RESISTOR		C335	QETC1CM-106	E CAPACITOR
	R334	QRD161J-221	RESISTOR		C336	QCVB1CN-103	CAPACITOR
	R335	QRD161J-391	RESISTOR		C337	QCBB1HJ-121	CAPACITOR
	R336	QRD161J-681	RESISTOR		C338	QCVB1CN-103	CAPACITOR
					C339	QCVB1CN-103	CAPACITOR

#	REF NO.	PART NO.	PART NAME, DESCRIPTION	#	REF NO.	PART NO.	PART NAME, DESCRIPTION
	C341	QCVB1CN-103	CAPACITOR		OR	MA165	DIODE
	C342	QCSB1HJ-100	CAPACITOR		D602	ISS133	DIODE
	C343	QCVB1CN-103	CAPACITOR		OR	MA165	DIODE
	C345	QCVB1CN-103	CAPACITOR		D604	ISS133	DIODE
	C346	QCVB1CN-103	CAPACITOR		R601	QRD161J-473	RESISTOR
	C347	QCSB1HJ-390	CAPACITOR		R602	QRD161J-152	RESISTOR
	C348	QCVB1CN-103	CAPACITOR		R603	QRD161J-222	RESISTOR
	C349	QCVB1CN-103	CAPACITOR		R608	QRD161J-152	RESISTOR
	C350	QCVB1CN-103	CAPACITOR		R609	QRD161J-222	RESISTOR
	C351	QCVB1CN-103	CAPACITOR		R613	QRD161J-223	RESISTOR
	C352	QE60JHM-476	E CAPACITOR		R616	QRD161J-122	RESISTOR
	C353	QCVB1CN-103	CAPACITOR		R617	QRD161J-122	RESISTOR
	C355	QCVB1CN-103	CAPACITOR		R620	QRD161J-103	RESISTOR
	C356	QER61HM-105	E CAPACITOR		R621	QRD161J-333	RESISTOR
	C357	QER61EM-475	E CAPACITOR		R623	QRD161J-223	RESISTOR
	L301	PU48530-101K	COIL		R625	QRD161J-223	RESISTOR
	L303	PU48530-101K	COIL		R626	QRD161J-100	RESISTOR
	L304	PU59152-390J	COIL		R627	QRD161J-470	RESISTOR
	L305	PU48530-222J	COIL		R628	QRD161J-223	RESISTOR
	L306	PU59152-221J	COIL		R629	QRD161J-331	RESISTOR
	L307	PU48530-821J	COIL		R630	QRD161J-224	RESISTOR
	L308	PU48530-101K	COIL		R631	QRD161J-123	RESISTOR
	L309	PU59152-100J	COIL		R632	QRD161J-562	RESISTOR
	L310	PU59152-100J	COIL		R633	QVZ3518-103	V RESISTOR,PB LEVEL
	L311	PU59153-822J	COIL		R634	QRD161J-103	RESISTOR
	L312	PU59153-101K	COIL		R635	QRD161J-122	RESISTOR
	L313	PU59153-101K	COIL		R636	QRD161J-472	RESISTOR
	L314	PU48530-101K	COIL		R637	QRD161J-393	RESISTOR
	L316	PU59152-150J	COIL		R638	QRD161J-273	RESISTOR
	L317	PU48530-101K	COIL		R639	QRD161J-122	RESISTOR
	EQ301	PU60811-2	EQUALIZER		R640	QRD161J-181	RESISTOR
	LPF301	PU58022	LOW PASS FILTER		R641	QVZ3518-473	V RESISTOR,BIAS ADJ
	BPF301	PU57072	BAND PASS FILTER		R642	QRD161J-333	RESISTOR
		OR PU57072-2	BAND PASS FILTER		R643	QRD161J-2R2	RESISTOR
	BPF302	PU60654	BAND PASS FILTER		R644	QRD161J-104	RESISTOR
		OR PU60654-2	BAND PASS FILTER		R645	QRD161J-270	RESISTOR
△	CF301	PU57073	CERAMIC FILTER		R646	QRD161J-103	RESISTOR
	DL301	PU58971-3	COMB FILTER		R647	QRD161J-332	RESISTOR
△	X301	PU60653	CRYSTAL UNITS		R648	QRD161J-103	RESISTOR
	T301	PU49057	LC BLOCK,APC ERROR PHASE		C601	QE5K1CM-336	E CAPACITOR
	TP6	PU56008	TEST-PIN		C602	QEK61HM-105	E CAPACITOR
	TP10	PU57545	TEST PIN, X37		C603	QCXB1CM-682	CAPACITOR
					C604	QEK61CM-336	E CAPACITOR
					C605	QEK61EM-475	E CAPACITOR
					C606	QFL31HJ-182	M CAPACITOR
					C607	QFL31HJ-222	M CAPACITOR
					C608	PU60550-105	E CAPACITOR
					C609	QEK61CM-106	E CAPACITOR
					C610	QFV71HJ-103	M CAPACITOR
					C611	QEK61HM-224	E CAPACITOR
	IC601	BA7751ALS	IC		C612	QEK61HM-105	E CAPACITOR
	Q601	2SC1740S(RS)	TRANSISTOR		C613	QEK61CM-226	E CAPACITOR
	Q603	2SC1740S(RS)	TRANSISTOR		C614	QEK61HM-225	E CAPACITOR
	Q605	2SC1740S(RS)	TRANSISTOR		C615	QEK61HM-106	E CAPACITOR
	Q606	DTA124ES	TRANSISTOR		C616	QEK61CM-106	E CAPACITOR
	Q607	DTA114ES	TRANSISTOR		C617	QFV71HJ-273	M CAPACITOR
	Q608	2SC1740S(RS)	TRANSISTOR		C618	QFV71HJ-153	TF CAPACITOR
	Q609	2SC1740S(RS)	TRANSISTOR		C619	QCXB1HJ-331	CAPACITOR
	Q610	2SC1740S(RS)	TRANSISTOR		C620	QFV71HJ-563	TF CAPACITOR
	Q611	DTA144ES	TRANSISTOR		C621	QEK61CM-476	E CAPACITOR
	Q612	DTA114ES	TRANSISTOR		C622	QCXB1CN-122	CAPACITOR
	Q613	DTC144EF	TRANSISTOR		C623	QCC11EJ-472	CAPACITOR
	Q614	DTC144EF	TRANSISTOR		C624	QCC31EK-272	CAPACITOR
	D601	ISS133	DIODE		C625	QEK61CM-106	E CAPACITOR
					C626	QFP42AF-682M	PP CAPACITOR
					C627	QFN31HK-222	M CAPACITOR

#	REF NO.	PART NO.	PART NAME, DESCRIPTION	#	REF NO.	PART NO.	PART NAME, DESCRIPTION
	C628	QEK41CM-107	E CAPACITOR		R11	QRSA08J-124Y	CHIP RESISTOR
	C629	QFL41HJ-562	TF CAPACITOR		R12	QRSA08J-103Y	RESISTOR
	L601	PU58308-103J	COIL		R13	QRSA08J-102	RESISTOR
	K603	PGZ00354	FERRITE BEADS		R14	QRSA08J-334YN	RESISTOR
	K604	PGZ00354	FERRITE BEADS		R15	QRSA08J-824YN	RESISTOR
△	T601	PU59949	OSC TRANSFORMER		R16	QVZ3521-105	V.R.SLOW TK PRESET(SP)
	TP631	PU54983	TEST PIN, X4(TP631-634)		R17	QRSA08J-184YN	RESISTOR
					R18	QVZ3521-105	V.R.SLOW TK PRESET(LP)
					R19	QRSA08J-274YN	RESISTOR
					R20	QRSA08J-824YN	RESISTOR
					R21	QRSA08J-683YN	RESISTOR
					R22	QRSA08J-103Y	RESISTOR
					R23	QRSA08J-102	RESISTOR
					R24	QRSA08J-223Y	RESISTOR
			*** 7. D/C SERVO BOARD ASSY <05> ***		R26	QRSA08J-334YN	RESISTOR
			*****		R27	QRSA08J-392YN	RESISTOR
			*****		R28	QRSA08J-103Y	RESISTOR
	PWBA	PRK10029A	D/C SERVO BOARD ASSY		R29	QRSA08J-104	RESISTOR
	IC1	HD49722NT	IC		R30	QRSA08J-222	RESISTOR
	IC2	BU2767S	IC		R31	QRSA08J-823YN	RESISTOR
	IC3	TC4S66F	IC		R32	QRSA08J-105YN	RESISTOR
	Q1	DTC144EU	TRANSISTOR		R33	QRSA08J-393YN	RESISTOR
	Q2	DTC144EU	TRANSISTOR		R34	QRSA08J-333YN	RESISTOR
	Q3	DTA124EU	TRANSISTOR		R35	QRSA08J-683YN	RESISTOR
	Q4	DTC144EU	TRANSISTOR		R36	QRSA08J-153	RESISTOR
	Q5	DTC124EU	TRANSISTOR		R37	QRSA08J-223Y	RESISTOR
	Q6	DTC144EU	TRANSISTOR		R38	QRSA08J-105YN	RESISTOR
	Q7	DTC144EU	TRANSISTOR		R39	QRSA08J-103Y	RESISTOR
	Q8	DTA124EU	TRANSISTOR		R40	QRSA08J-102	RESISTOR
	Q9	DTA124EU	TRANSISTOR		R41	QRSA08J-103Y	RESISTOR
	Q10	DTA124EU	TRANSISTOR		R42	QRSA08J-123YN	RESISTOR
	Q11	DTA124EU	TRANSISTOR		R43	QRSA08J-274YN	RESISTOR
	D1	ISS133	DIODE		R44	QRSA08J-105YN	RESISTOR
	D2	ISS133	DIODE		R45	QRSA08J-105YN	RESISTOR
	D3	ISS133	DIODE		R46	QRSA08J-273YN	RESISTOR
	D4	ISS133	DIODE		R47	QRSA08J-222	RESISTOR
	D5	ISS133	DIODE		R48	QRSA08J-563YN	RESISTOR
	D6	ISS133	DIODE		R49	QRSA08J-105YN	RESISTOR
	D8	ISS133	DIODE		R50	QRSA08J-273YN	RESISTOR
	D9	ISS133	DIODE		R51	QRSA08J-154YN	RESISTOR
	D10	ISS133	DIODE		R52	QRSA08J-154YN	RESISTOR
	D11	ISS133	DIODE		R54	QRSA08J-102	RESISTOR
	D12	ISS133	DIODE		R55	QVZ3521-684	V RESISTOR, PB SW POINT TK
	D13	ISS133	DIODE		R56	QRSA08J-104	RESISTOR
	D14	ISS133	DIODE		R57	QRSA08J-823YN	RESISTOR
	D15	ISS133	DIODE		R58	QRSA08J-222	RESISTOR
	D16	ISS133	DIODE		R59	QVZ3521-474	V RESISTOR, X2 PB(LP)
	D17	ISS133	DIODE		R60	QVZ3521-474	V RESISTOR, TRACKING PRESET
	D18	ISS133	DIODE		R61	QVZ3521-474	V RESISTOR, X2 PB TK(SP)
	D19	ISS133	DIODE		R62	QRSA08J-103Y	RESISTOR
	D20	ISS133	DIODE		R63	QRSA08J-102	RESISTOR
	D21	ISS133	DIODE		R64	QRSA08J-155YN	RESISTOR
	D22	ISS133	DIODE		R66	QRSA08J-102	RESISTOR
	D23	ISS133	DIODE		R67	QRSA08J-102	RESISTOR
	R1	QRSA08J-104	RESISTOR		R68	QRSA08J-102	RESISTOR
	R2	QRSA08J-562Y	RESISTOR		R69	QRSA08J-102	RESISTOR
	R3	QRSA08J-273YN	RESISTOR		R70	QRSA08J-104	RESISTOR
	R4	QRSA08J-473	RESISTOR		R71	QRSA08J-332YN	RESISTOR
	R5	QRSA08J-393YN	RESISTOR		R72	QRSA08J-102	RESISTOR
	R6	QRSA08J-392YN	RESISTOR		R73	QRSA08J-182Y	RESISTOR
	R7	QRSA08J-683YN	RESISTOR		R74	QRSA08J-104	RESISTOR
	R8	QRSA08J-123YN	RESISTOR		R75	QRSA08J-0R0	RESISTOR
	R9	QRSA08J-332YN	RESISTOR		R76	QRSA08J-0R0	RESISTOR
	R10	QRSA08J-472	RESISTOR		B1	QRSA08J-0R0	RESISTOR, X46
					C1	QFV71HJ-224	M CAPACITOR

#	REF NO.	PART NO.	PART NAME, DESCRIPTION	#	REF NO.	PART NO.	PART NAME, DESCRIPTION
C3	QFV71HJ-124	M CAPACITOR		IC2	NJM2904S	IC	
C4	QFV71HJ-104	M CAPACITOR		IC3	NJM2903S	IC	
C5	QFV71HJ-393	M CAPACITOR		IC4	MN4030BS	IC	
C6	QEK61CM-226MZ	E CAPACITOR		IC5	TA78L005AP	IC	
C7	QCYA1HK-102	CAPACITOR		IC6	TA78L009AP	IC	
C8	QEK61CM-226MZ	E CAPACITOR		IC7	NJM2904S	IC	
C9	QCC11CK-102	CAPACITOR		IC8	NJM2904S	IC	
C10	QCTA1CH-101	CAPACITOR		IC9	MN4053BS	IC	
C11	QCBB1HJ-101	CAPACITOR		IC10	NJM2904S	IC	
C14	QFV71HJ-474	M CAPACITOR		IC11	NJM2903S	IC	
C16	QCYA1HK-102	CAPACITOR		IC12	MN4053BS	IC	
C17	QCYA1HK-103	CAPACITOR		IC13	BA6302AF	IC	
C18	QEK61CM-226MZ	E CAPACITOR		IC14	NJM2904S	IC	
C19	QFV71HJ-334	M CAPACITOR		IC15	NJM2903S	IC	
C20	QFL31HJ-682	M CAPACITOR		IC16	MN4013BS	IC	
C21	QEK61EM-475MZ	E CAPACITOR		IC17	MN1280P	IC	
C22	QEK61EM-475MZ	E CAPACITOR		IC18	MN4013BS	IC	
C23	QEK61CM-106MZ	E CAPACITOR		IC19	MN4069UBS	IC	
C24	QEK61CM-106MZ	E CAPACITOR		IC20	MN4081BS	IC	
C25	QEN61HM-105MZ	NP E CAPACITOR		IC21	MN4081BS	IC	
C26	QFV71HJ-104	M CAPACITOR		IC22	MN4538BS	IC	
C27	QCYA1HK-102	CAPACITOR		Q1	2SD973AQ,R,S	TRANSISTOR	
C28	QCTA1CH-471	CAPACITOR		Q2	DTC124EK	TRANSISTOR	
C29	QFL31HJ-682	M CAPACITOR		Q3	2SD973AQ,R,S	TRANSISTOR	
C30	QFL31HJ-102	M CAPACITOR		Q4	DTC124EK	TRANSISTOR	
C31	QFV71HJ-124	M CAPACITOR		Q5	DTC124EK	TRANSISTOR	
C32	QCYA1HK-102	CAPACITOR		Q6	DTC144EK	TRANSISTOR	
C33	QCYA1HK-102	CAPACITOR		D1	ISS133	DIODE	
C34	QEK61AM-226MZ	E CAPACITOR		D2	DA204K	DIODE	
C35	QCTA1CH-101	CAPACITOR		D4	DAN202K	CHIP DIODE ARRAY	
C36	QEK61AM-226MZ	E CAPACITOR		D5	DAN202K	CHIP DIODE ARRAY	
C37	QCTA1CH-150	CAPACITOR		D6	DAN202K	CHIP DIODE ARRAY	
C38	QEK61HM-105	E CAPACITOR		D7	ISS133	DIODE	
C39	QEK61HM-105	E CAPACITOR		D8	ISS133	DIODE	
C40	QCYA1HK-103	CAPACITOR		D9	ISS133	DIODE	
C41	QCYA1HK-102	CAPACITOR		D10	ISS133	DIODE	
C42	QEK61CM-226MZ	E CAPACITOR		D11	ISS133	DIODE	
C43	QCTA1CH-101	CAPACITOR		R1	QRSA08J-102	RESISTOR	
C44	QCYA1HK-102	CAPACITOR		R2	QRSA08J-333YN	RESISTOR	
C45	QFV71HJ-334	M CAPACITOR		R3	QRSA08J-103Y	RESISTOR	
C46	QFV71HJ-394	M CAPACITOR		R4	QVZ3521-102	V RESISTOR,FG A D ADJ	
L1	PU48530-101K	COIL		R5	QRSA08J-103Y	RESISTOR	
L2	PU48530-101K	COIL		R6	QRSA08J-102	RESISTOR	
L3	PU48530-100K	COIL		R7	QRSA08J-102	RESISTOR	
TH1	NTH5D223KA OR NTH5D223LA	THERMISTOR		R8	QRSA08J-333YN	RESISTOR	
TP1	PU56008	TEST-PIN, X9		R9	QRSA08J-103Y	RESISTOR	
CN1	PU58844-3	CAP HOUSING		R10	QVZ3521-102	V RESISTOR,FG B D ADJ	
CN2	PU58931-16	CAP HOUSING		R11	QRSA08J-103Y	RESISTOR	
CN3	PU58844-5	CAP HOUSING		R12	QRSA08J-222	RESISTOR	
CN4	PU58844-7R	CAP HOUSING		R13	QRSA08J-105YN	RESISTOR	
CN5	PU58844-7	CAP HOUSING		R14	QRSA08J-103Y	RESISTOR	
CN6	PU58844-5Y	CAP HOUSING		R15	QRSA08J-103Y	RESISTOR	
CN7	PU58931-20	CAP HOUSING		R16	QRSA08J-222	RESISTOR	

***** 8. TIME LAPSE SERVO BOARD ASSY <06> *****							
PWBA	PRK10030A-01	TIME LAPSE SERVO BOARD ASSY		R17	QRSA08J-105YN	RESISTOR	
IC1	NJM2904S	IC		R18	QRSA08J-103Y	RESISTOR	
				R19	QRSA08J-103Y	RESISTOR	
				R20	QRSA08J-104	RESISTOR	
				R22	QRSA08J-102	RESISTOR	
				R23	QRSA08J-102	RESISTOR	
				R24	QRSA08J-104	RESISTOR	
				R25	QRSA08J-102	RESISTOR	
				R27	QRSA08J-103Y	RESISTOR	
				R28	QRSA08J-182Y	RESISTOR	
				R29	QRSA08J-123YN	RESISTOR	
				R30	QRSA08J-102	RESISTOR	

#	REF NO.	PART NO.	PART NAME, DESCRIPTION	#	REF NO.	PART NO.	PART NAME, DESCRIPTION
R31	QRSA08J-683YN	RESISTOR		C5	QCS31HJ-101	CAPACITOR	
R32	QRSA08J-103Y	RESISTOR		C6	QCS31HJ-101	CAPACITOR	
R33	QRSA08J-103Y	RESISTOR		C7	QFV41HJ-684	TF CAPACITOR	
R34	QRSA08J-223Y	RESISTOR		C8	QER61CM-226	E CAPACITOR	
R35	QRSA08J-223Y	RESISTOR		C9	QCF31HP-103	CAPACITOR	
R36	QRSA08J-223Y	RESISTOR		C10	QCF31HP-103	CAPACITOR	
R37	QRSA08J-223Y	RESISTOR					
R38	QVZ3521-104	V RESISTOR,STOP S-2 ADJ		C11	QER61CM-226	E CAPACITOR	
R39	QRSA08J-223Y	RESISTOR		C12	QCF31HP-103	CAPACITOR	
R40	QRSA08J-122YN	RESISTOR		C13	QER61CM-226	E CAPACITOR	
R41	QRSA08J-103Y	RESISTOR		C14	QCF31HP-103	CAPACITOR	
R42	QRSA08J-103Y	RESISTOR		C15	QER61CM-226	E CAPACITOR	
R43	QVZ3521-332	V RESISTOR,STOP S-1 ADJ		C16	QCF31HP-103	CAPACITOR	
R44	QRSA08J-103Y	RESISTOR		C17	QER61CM-226	E CAPACITOR	
R45	QVZ3521-472	V RESISTOR,STOP S-3 ADJ		C18	QER61CM-226	E CAPACITOR	
R46	QRSA08J-103Y	RESISTOR		C19	QCF31HP-103	CAPACITOR	
R47	QRSA08J-684YN	RESISTOR		C20	QFN31HK-223	M CAPACITOR	
R48	QRSA08J-223Y	RESISTOR		C21	QCS31HJ-330	CAPACITOR	
R49	QRSA08J-103Y	RESISTOR		C22	QCF31HP-103	CAPACITOR	
R50	QRSA08J-103Y	RESISTOR		C24	QER61CM-226	E CAPACITOR	
R51	QRSA08J-102	RESISTOR		C25	QER61CM-226	E CAPACITOR	
R52	QRSA08J-103Y	RESISTOR		C26	QCS31HJ-221	CAPACITOR	
R53	QRSA08J-104	RESISTOR		C27	QFP42AJ-272	PP CAPACITOR	
R54	QRSA08J-102	RESISTOR		C29	QFN31HJ-392	M CAPACITOR	
R55	QRSA08J-102	RESISTOR		C30	QCF31HP-102	CAPACITOR	
R56	QVZ3521-154	V RESISTOR,TL D ADJ		C31	QER61CM-226	E CAPACITOR	
R57	QRSA08J-224YN	RESISTOR		C32	QER61HM-104GZ	E CAPACITOR	
R58	QRSA08J-333YN	RESISTOR		C33	QCF31HP-102	CAPACITOR	
R59	QRSA08J-223Y	RESISTOR		C34	QER61HM-105GZ	E CAPACITOR	
R60	QRSA08J-223Y	RESISTOR		C35	QCF31HP-102	CAPACITOR	
R61	QRSA08J-103Y	RESISTOR		C36	QCF31HP-102	CAPACITOR	
R62	QVZ3521-103	V RESISTOR,D REF ADJ		C37	QCF31HP-102	CAPACITOR	
R63	QRSA08J-104	RESISTOR		C38	QFN31HJ-103	M CAPACITOR	
R64	QRSA08J-682	RESISTOR		C39	QCS31HJ-391	CAPACITOR	
R65	QRSA08J-104	RESISTOR		C40	QER61CM-226	E CAPACITOR	
R66	QRSA08J-104	RESISTOR		L1	PUS3223-101J	COIL	
R67	QRSA08J-104	RESISTOR		L2	PUS3223-101J	COIL	
R69	QRSA08J-103Y	RESISTOR		L3	PUS3223-101J	COIL	
R70	QRSA08J-223Y	RESISTOR		TH1	PUS2108-100K	POSITIVE THERMISTOR	
R71	QRSA08J-102	RESISTOR		TP1	PUS4983	TEST PIN, X13	
R72	QRSA08J-103Y	RESISTOR		CN1	PUS8844-5	CAP HOUSING	
R73	QRSA08J-473	RESISTOR		CN2	PUS8844-5Y	CAP HOUSING	
R74	QRSA08J-333YN	RESISTOR		CN3	PUS8929-16	HOUSING	
R75	QVZ3521-103	V RESISTOR,TL ADV ADJ		CN4	PUS8929-16	HOUSING	
R76	QRSA08J-103Y	RESISTOR		▲ CPI	ICP-F38	CIRCUIT PROTECTOR	
R77	QRSA08J-104	RESISTOR					
R78	QRSA08J-104	RESISTOR					
R79	QRSA08J-102	RESISTOR					
R80	QRSA08J-104	RESISTOR					
R81	QRSA08J-103Y	RESISTOR					
R82	QRSA08J-104	RESISTOR					
R83	QRSA08J-104	RESISTOR					
R84	QRSA08J-102	RESISTOR					
R85	QRSA08J-102	RESISTOR					
R86	QRSA08J-104	RESISTOR					
R87	QVZ3521-224	V RESISTOR,LIMIT D ADJ					
R88	QRSA08J-124Y	CHIP RESISTOR		PWBA	PRK10040A-05	MECHAON BOARD ASSY	
R89	QRSA08J-103Y	RESISTOR		IC1	M50938E-349SP	IC	
R90	QRSA08J-102	RESISTOR		IC2	BA6259N	IC	
R91	QRSA08J-563YN	RESISTOR		IC3	M50255P	IC	
R92	QRSA08J-103Y	RESISTOR		IC4	M51957BL	IC	
R93	QRSA08J-102	RESISTOR					
R94	ERT-D2FHL103S	THERMISTOR		IC101	VC2032	IC	
C1	QCS31HJ-101	CAPACITOR		IC102	MN4053B	IC	
C2	QER61CM-106GZ	E CAPACITOR		IC103	MN4053B	IC	
C3	QCS31HJ-101	CAPACITOR		IC104	VC2064	IC	
C4	QER61CM-106GZ	E CAPACITOR		IC105	VC2064	IC	
				IC106	VC2032	IC	

#	REF NO.	PART NO.	PART NAME, DESCRIPTION	#	REF NO.	PART NO.	PART NAME, DESCRIPTION
	Q1	2SD973AR	TRANSISTOR		R43	QRD161J-472	RESISTOR
	Q2	DTC144EF	TRANSISTOR		R44	QRD161J-472	RESISTOR
	Q3	DTC144EF	TRANSISTOR		R45	QRD161J-102	RESISTOR
	Q6	DTA144EF	TRANSISTOR		R46	QRD161J-103	RESISTOR
	Q101	DTA124EF	TRANSISTOR		R47	QRD161J-103	RESISTOR
	Q102	2SD637R,S	TRANSISTOR		R48	QRD161J-103	RESISTOR
	Q103	2SD637R,S	TRANSISTOR		R49	QRD161J-103	RESISTOR
	Q104	2SD637R,S	TRANSISTOR		R51	QRD161J-102	RESISTOR
	D1	HZS4.3EB2	ZENER DIODE		R52	QRD161J-102	RESISTOR
	D2	ISS133	DIODE		R53	QRD161J-103	RESISTOR
	D3	ISS133	DIODE		R54	QRD161J-103	RESISTOR
	D4	ISS133	DIODE		R55	QRD161J-103	RESISTOR
	D6	ISS133	DIODE		R56	QRD161J-103	RESISTOR
	D8	ISS133	DIODE		R57	QRD161J-103	RESISTOR
	D9	HZS7.5EB2	ZENER DIODE		R58	QRD161J-472	RESISTOR
	D10	MC921	DIODE		R59	QRD161J-103	RESISTOR
	D11	ISS133	DIODE		R60	QRD161J-103	RESISTOR
	D12	ISS133	DIODE		R61	QRD161J-103	RESISTOR
	D13	ISS133	DIODE		R62	QRD161J-103	RESISTOR
	D101	ISS133	DIODE		R63	QRD161J-472	RESISTOR
	D102	ISS133	DIODE		R64	QRD161J-182	RESISTOR
	D103	ISS133	DIODE		R65	QRG016J-221A	OMF RESISTOR
	D104	ISS133	DIODE		R101	QRD161J-222	RESISTOR
	R1	QRD161J-332	RESISTOR		R102	QRD161J-222	RESISTOR
	R2	QRD161J-122	RESISTOR		R103	QRD161J-562	RESISTOR
	R3	QRD161J-823	RESISTOR		R104	QRD161J-102	RESISTOR
	R4	QRD161J-102	RESISTOR		R105	QRD161J-102	RESISTOR
	R5	QRD161J-102	RESISTOR		R106	QRD161J-103	RESISTOR
	R6	QRD161J-103	RESISTOR		R107	QRD161J-222	RESISTOR
	R7	QRD161J-102	RESISTOR		R108	QRD161J-222	RESISTOR
	R8	QRD161J-103	RESISTOR		R109	QRD161J-124	RESISTOR
	R9	QRD161J-472	RESISTOR		R110	QRD161J-223	RESISTOR
	R10	QRD161J-103	RESISTOR		R111	QRD161J-223	RESISTOR
	R11	QRD161J-105	RESISTOR		R112	QRD161J-103	RESISTOR
	R12	QRD161J-472	RESISTOR		R113	QRD161J-333	RESISTOR
	R13	QRD161J-472	RESISTOR		R114	QRD161J-333	RESISTOR
	R14	QRD161J-472	RESISTOR		R115	QRD161J-222	RESISTOR
	R15	QRD161J-472	RESISTOR		R116	QRD161J-222	RESISTOR
	R16	QRD161J-472	RESISTOR		R117	QRD161J-222	RESISTOR
	R17	QRD161J-472	RESISTOR		R118	QRD161J-0R0	RESISTOR
	R18	QRD161J-472	RESISTOR		R119	QRD161J-0R0	RESISTOR
	R19	QRD161J-124	RESISTOR		R120	QRD161J-0R0	RESISTOR
	R20	QRD161J-472	RESISTOR		R124	QRD161J-222	RESISTOR
	R21	QRD161J-124	RESISTOR		R125	QRD161J-222	RESISTOR
	R22	QRD161J-472	RESISTOR		R126	QRD161J-222	RESISTOR
	R23	QRD161J-333	RESISTOR		R127	QRD161J-103	RESISTOR
	R24	QRD161J-472	RESISTOR		R128	QRD161J-103	RESISTOR
	R25	QRD161J-472	RESISTOR		R129	QRD161J-102	RESISTOR
	R26	QRD161J-472	RESISTOR		R130	QRD161J-222	RESISTOR
	R27	QRD161J-472	RESISTOR		R131	QRD161J-222	RESISTOR
	R28	QRD161J-472	RESISTOR		R132	QRD161J-222	RESISTOR
	R29	QRD161J-103	RESISTOR		R133	QRD161J-222	RESISTOR
	R30	QRD161J-102	RESISTOR		R134	QRD161J-222	RESISTOR
	R31	QRD161J-103	RESISTOR		R135	QRD161J-222	RESISTOR
	R32	QRD161J-331	RESISTOR		R136	QRD161J-0R0	RESISTOR
	R33	QRD161J-822	RESISTOR		R137	QRD161J-0R0	RESISTOR
	R34	QRD161J-103	RESISTOR		R139	QRD161J-0R0	RESISTOR
	R35	QRD161J-223	RESISTOR		R142	QRD161J-102	RESISTOR
	R36	QRD161J-152	RESISTOR		R143	QRD161J-334	RESISTOR
	R37	QRD161J-103	RESISTOR		R144	QRD161J-124	RESISTOR
	R38	QRD161J-103	RESISTOR		R145	QRD161J-0R0	RESISTOR
	R39	QRD161J-103	RESISTOR		R146	QRD161J-103	RESISTOR
	R41	QRD161J-472	RESISTOR		R147	QRD161J-103	RESISTOR
	R42	QRD161J-472	RESISTOR		R148	QRD161J-561	RESISTOR
					R149	QRD161J-103	RESISTOR
					R150	QRD161J-102	RESISTOR
					R41	QRB047J-472	RESISTOR ARRAY

#	REF NO.	PART NO.	PART NAME, DESCRIPTION	#	REF NO.	PART NO.	PART NAME, DESCRIPTION
	RA2	OR QRB049J-472	RESISTOR ARRAY		CN14	PU58844-9R	CAP HOUSING
		QRB047J-103	RESISTOR ARRAY		CN15	PU58844-4	CAP HOUSING
		OR QRB049J-103	RESISTOR ARRAY		CN16	PU58844-5	CAP HOUSING
B2		QRD161J-0R0	RESISTOR		CN17	PU58844-6	CAP HOUSING
B3		QRD161J-0R0	RESISTOR		CN18	PU59934-17	WIRE HOLDER
C1		QCC11EK-473	CAPACITOR		CN19	PU58844-8Y	CAP HOUSING
C2		QCBB1HJ-101	CAPACITOR		CN20	PU58844-5R	CAP HOUSING
C3		QCBB1HJ-101	CAPACITOR		CN21	PU58844-5Y	CAP HOUSING
C4		QCC11EK-473	CAPACITOR		CN22	PU58844-6R	CAP HOUSING
C5		QETC1EM-475	E CAPACITOR		CN23	PU58844-6Y	CAP HOUSING
C6		QCF31HP-223	CAPACITOR		CN24	PU58844-7	CAP HOUSING
C7		QCF31HP-223	CAPACITOR		CN25	PU58844-9Y	CAP HOUSING
C8		QCFB1EZ-223	CAPACITOR		CN26	PU58844-14	CAP HOUSING
C9		QETC1EM-335	E CAPACITOR				*****
C10		QCFB1EZ-223	CAPACITOR				*****
C11		QCBB1HJ-101	CAPACITOR				*****
C12		QCBB1HJ-101	CAPACITOR				* 10. TIME LAPS SUB SERVO BOARD (1) ASSY <08*
C13		QETC1EM-474	E CAPACITOR				*****
C14		QCS31HJ-680	CAPACITOR				*****
C15		QCS31HJ-680	CAPACITOR				*****
C16		QCF31HP-473	CAPACITOR				*****
C101		QCF31HP-103	CAPACITOR		PWBA	PGE20321A	TIME LAPSE SUB SERVO B.ASSY
C102		QER61CM-226	E CAPACITOR		PWBA1	PGE20321A1	TL SUB SERVO BOARD (1)ASSY
C103		QCS31HJ-101	CAPACITOR		IC1	UPD75008CU-71A	IC
C104		QCF31HP-103	CAPACITOR		IC2	TC4069UBP	IC
C105		QER61CM-226	E CAPACITOR		IC3	IC-PST523H-2	IC
C106		QER61CM-226	E CAPACITOR		Q2	DTC114EF	TRANSISTOR
C107		QCF31HP-103	CAPACITOR		Q3	DTC114EF	TRANSISTOR
C108		QCS31HJ-101	CAPACITOR		Q4	DTC114EF	TRANSISTOR
C109		QCS31HJ-101	CAPACITOR		Q5	DTA124EF	TRANSISTOR
C110		QER61CM-106	E CAPACITOR		D1	ISS133	DIODE
C111		QCF31HP-102	CAPACITOR		D2	ISS133	DIODE
L1		PU59152-100J	COIL		D3	RD7.5ES-T1B1	ZENER DIODE
L101		PU59152-101J	COIL		D4	ISS133	DIODE
L102		PU59152-101J	COIL		D5	ISS133	DIODE
△ CF1		PU60030	RESONATOR		D6	ISS133	DIODE
K1		PGZ00354	FERRITE BEADS		R1	QRD161J-103	RESISTOR
K2		PGZ00354	FERRITE BEADS		R2	QRD161J-103	RESISTOR
K3		PGZ00354	FERRITE BEADS		R4	QRD161J-103	RESISTOR
K4		PGZ00354	FERRITE BEADS		R5	QRD161J-472	RESISTOR
K5		PGZ00354	FERRITE BEADS		R6	QRD161J-102	RESISTOR
K6		PGZ00354	FERRITE BEADS		R7	QRD161J-102	RESISTOR
K7		PGZ00354	FERRITE BEADS		R8	QRD161J-102	RESISTOR
SKT1		PGZ01428-064	IC SOCKET,(FOR IC1)		R9	QRD161J-102	RESISTOR
WR1		PW30112-LOAF6AH	PARALLEL WIRE		R10	QRD161J-102	RESISTOR
J101		QWE251-04A2A2	WIRE		R11	QRD161J-102	RESISTOR
J102		QWE252-07A2A2	WIRE		R12	QRD161J-102	RESISTOR
TP1		PU54983	TEST PIN, X3		R13	QRD161J-102	RESISTOR
CN1		PU58844-2	CAP HOUSING		R14	QRD161J-102	RESISTOR
CN2		PU58930-16	CAP HOUSING		R15	QRD161J-102	RESISTOR
CN3		PU58928-16	CAP HOUSING		R16	QRD161J-102	RESISTOR
CN4		PU58928-16	CAP HOUSING		R17	QRD161J-102	RESISTOR
CN5		PU58844-3	CAP HOUSING		R18	QRD161J-563	RESISTOR
CN6		PU58844-3R	CAP HOUSING		R19	QRD161J-102	RESISTOR
CN7		PU58930-20	CAP HOUSING		R20	QRD161J-123	RESISTOR
CN8		PU58844-2R	CAP HOUSING		R21	QRD161J-682	RESISTOR
CN10		PU58844-8	CAP HOUSING		R22	QRD161J-471	RESISTOR
CN11		PU58844-15	CAP HOUSING		R23	QRD161J-471	RESISTOR
CN12		PU58844-9Y	CAP HOUSING		R24	QRD161J-103	RESISTOR
CN13		PU58844-9	CAP HOUSING		R25	QRD161J-103	RESISTOR
					R26	QRD161J-103	RESISTOR
					R27	QRD161J-103	RESISTOR
					R28	QRD161J-103	RESISTOR
					R29	QRD161J-682	RESISTOR
					R30	QRD161J-103	RESISTOR

#	REF NO.	PART NO.	PART NAME, DESCRIPTION	#	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R31	QRD161J-154	RESISTOR		R104	QVZ3521-224	V.R,REC CTL POS.ADJ
	R32	QRD161J-102	RESISTOR		R105	QRD161J-103	RESISTOR
	R33	QRD161J-102	RESISTOR		R106	QVZ3521-474	V.R,DRUM ADD PULSE POS.
	R34	QRD161J-102	RESISTOR		R107	QRD161J-333	RESISTOR
	R35	QRD161J-102	RESISTOR		R108	QRD161J-183	RESISTOR
	R36	QRD161J-102	RESISTOR		R109	ERT-D2FHL103S	THERMISTOR
	R37	QRD161J-102	RESISTOR		R110	QRD161J-102	RESISTOR
	R38	QRD161J-102	RESISTOR		R111	QVZ3521-334	V.R,DRUM ADD PULSE WIDTH
	R39	QRD161J-102	RESISTOR		R112	QRD161J-104	RESISTOR
	R40	QRD161J-102	RESISTOR		R113	QRD161J-274	RESISTOR
	R41	QRD161J-102	RESISTOR		R114	QRD161J-103	RESISTOR
	R42	QRD161J-102	RESISTOR		R115	QRD161J-103	RESISTOR
	R43	QRD161J-102	RESISTOR		R116	QRD161J-682	RESISTOR
	R44	QRD161J-102	RESISTOR		R117	QRD161J-223	RESISTOR
	R45	QRD161J-0R0	RESISTOR		R118	QRD161J-823	RESISTOR
	R46	QRD161J-103	RESISTOR		R119	QRD161J-394	RESISTOR
	R47	QRD161J-103	RESISTOR		R120	QRD161J-334	RESISTOR
	R48	QRD161J-102	RESISTOR		R121	QRD161J-223	RESISTOR
	R49	QRD161J-103	RESISTOR		R122	QVZ3521-104	V.R,SPD F-V ADJ(LP)
	R50	QRD161J-103	RESISTOR		R123	QVZ3521-473	V.R,SPD F-V ADJ(SP)
	R51	QRD161J-103	RESISTOR		R124	QRD161J-103	RESISTOR
	R52	QRD161J-102	RESISTOR		R125	QRD161J-102	RESISTOR
	R55	QRD161J-103	RESISTOR		R126	QVZ3521-105	V.R,DRUM A.P.PDS.(24H)
	RA1	QRB087J-104	RESISTOR ARRAY		C101	QFV71HJ-104	M CAPACITOR
	RA2	QRB077J-104	RESISTOR ARRAY		C102	QFV71HJ-104	M CAPACITOR
	C1	QFN31HJ-102	M CAPACITOR		C103	QFV71HJ-104	M CAPACITOR
	C2	QFN31HJ-102	M CAPACITOR		C104	QFV71HJ-104	M CAPACITOR
	C3	QER61CM-226	E CAPACITOR		C105	QER61HM-105	E CAPACITOR
	C4	QER61CM-226	E CAPACITOR		C106	QER61CM-106	E CAPACITOR
	C5	QER61CM-106	E CAPACITOR		C107	QFN31HK-223	M CAPACITOR
	C6	QCS11HJ-391	CAPACITOR		C108	QFN31HK-103	M CAPACITOR
	C7	QCS11HJ-391	CAPACITOR		TP101	PU54983	TEST PIN
	L1	PU59152-101J	COIL		CN5	PGZ01081-08	MICRO HEADER
	CF1	PU59576	RESONATOR		CN6	PGZ01081-07	MICRO HEADER
	BUZ1	PGZ01299	BUZZER				
	SKT1	PGZ01313	IC SOCKET,(FOR IC1)				
	TP1	PU54983	TEST PIN, X5				
	CN1	PU58844-15Y	CAP HOUSING		PWB	PRK30034A	VIDEO SUB BOARD ASSY
	CN2	PU58844-15	CAP HOUSING		IC1	BU3791	IC
	CN3	PU58844-10	CAP HOUSING				
					Q1	DTC144ES	TRANSISTOR
					Q2	DTC124ES	TRANSISTOR
					Q3	DTC144WS	TRANSISTOR
					D1	ISS133	DIODE
					R1	QRD161J-103	RESISTOR
					R2	QRD161J-104	RESISTOR
					R3	QRD161J-104	RESISTOR
					R4	QRD161J-104	RESISTOR
					R5	QRD161J-104	RESISTOR
					R6	QRD161J-822	RESISTOR
					R7	QRD161J-104	RESISTOR
					R8	QRD161J-103	RESISTOR
					R9	QRD161J-563	RESISTOR
					R10	QRD161J-472	RESISTOR
					C1	QCB81HJ-102	CAPACITOR
					C2	QCC1ICK-104	CAPACITOR
					C3	QCB81HJ-102	CAPACITOR
					C4	QCB81HJ-121	CAPACITOR
					C5	QEK61AM-336	E CAPACITOR

#	REF NO.	PART NO.	PART NAME, DESCRIPTION	#	REF NO.	PART NO.	PART NAME, DESCRIPTION
	C6	QFN31HJ-103	M CAPACITOR		Q111	DTC124EK	TRANSISTOR
	CN1	PU58844-7	CAP HOUSING		Q112	2SC2412K	TRANSISTOR
	CN2	PU58844-7R	CAP HOUSING		D1	DAN202K	CHIP DIODE ARRAY
	CN3	PU58844-5	CAP HOUSING		D2	DAN202K	CHIP DIODE ARRAY
	CN4	PU58844-3	CAP HOUSING		D3	DAN202K	CHIP DIODE ARRAY
	CN5	PU58844-2	CAP HOUSING		D4	DAN202K	CHIP DIODE ARRAY
					D5	DAN202K	CHIP DIODE ARRAY
					D6	DAN202K	CHIP DIODE ARRAY
					D7	DAN202K	CHIP DIODE ARRAY

					D102	DAP202K	DIODE
					D103	DAN202K	CHIP DIODE ARRAY
					R1	QRSA08J-100YN	RESISTOR
					R2	QRSA08J-272YN	RESISTOR
					R3	QRSA08J-100YN	RESISTOR
					R4	QRSA08J-272YN	RESISTOR
					R5	QRSA08J-103Y	RESISTOR
					R6	QRSA08J-100YN	RESISTOR
					R7	QRSA08J-272YN	RESISTOR
					R8	QRSA08J-100YN	RESISTOR
					R9	QRSA08J-272YN	RESISTOR
					R10	QRSA08J-103Y	RESISTOR
					R11	QRSA08J-102	RESISTOR
					R12	QVZ3531-152	V RESISTOR,LP CH2 Q
					R13	QVZ3531-152	V RESISTOR,LP CH1 Q
					R14	QRSA08J-103Y	RESISTOR
					R15	QVZ3531-152	V RESISTOR,SP CH2 Q
					R16	QRSA08J-102	RESISTOR
					R17	QRSA08J-821YN	RESISTOR
					R18	QVZ3531-152	V RESISTOR,SP CH1 Q
					R19	QRD161J-333	RESISTOR
					R20	QRSA08J-101YN	RESISTOR
					R21	QRSA08J-393YN	RESISTOR
					R22	QRSA08J-222	RESISTOR
					R23	QRSA08J-103Y	RESISTOR
					R24	QRSA08J-103Y	RESISTOR
					R25	QRSA08J-393YN	RESISTOR
					R26	QRD161J-222	RESISTOR
					R27	PU52108-150	POSITIVE THERMISTOR
					R28	QRSA08J-221Y	RESISTOR
					R29	QRSA08J-102	RESISTOR
					R30	QRSA08J-122YN	RESISTOR
					R31	QRSA08J-221Y	RESISTOR
					R32	QRSA08J-102	RESISTOR
					R33	QRSA08J-122YN	RESISTOR
					R34	QRSA08J-103Y	RESISTOR
					R35	QRSA08J-122YN	RESISTOR
					R36	QRSA08J-103Y	RESISTOR
					R37	QRSA08J-122YN	RESISTOR
					R38	QRSA08J-103Y	RESISTOR
					R39	QRSA08J-122YN	RESISTOR
					R40	QRSA08J-393YN	RESISTOR
					R41	QRSA08J-821YN	RESISTOR
					R42	QRSA08J-393YN	RESISTOR
					R43	QRSA08J-681YN	RESISTOR
					R44	QRSA08J-393YN	RESISTOR
					R45	QRSA08J-681YN	RESISTOR
					R46	QRSA08J-623YN	RESISTOR
					R47	QRSA08J-821YN	RESISTOR
					R48	QRSA08J-680YN	RESISTOR
					R49	QRSA08J-102	RESISTOR
					R50	QRSA08J-222	RESISTOR
					R51	QRSA08J-332YN	RESISTOR
					R52	QRSA08J-123YN	RESISTOR
					R53	QRSA08J-680YN	RESISTOR
					R54	QRSA08J-472	RESISTOR

#	REF NO.	PART NO.	PART NAME, DESCRIPTION	#	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R55	QRSA08J-102	RESISTOR		C40	QER50JM-476	E CAPACITOR
	R56	QRSA08J-103Y	RESISTOR		C41	QEE41EM-105	TANTAL CAPACITOR
	R57	QRSA08J-103Y	RESISTOR		C42	QEE41EM-105	TANTAL CAPACITOR
	R58	QRSA08J-823YN	RESISTOR		C43	QEE41EM-105	TANTAL CAPACITOR
	R59	QRSA08J-681YN	RESISTOR		C44	QCFA1HZ-103	CAPACITOR
	R60	QRSA08J-103Y	RESISTOR		C45	QCFA1HZ-103	CAPACITOR
	R61	QRSA08J-561YN	RESISTOR		C46	QCFA1HZ-103	CAPACITOR
	R101	QRSA08J-223Y	RESISTOR		C47	QCFA1HZ-103	CAPACITOR
	R102	QRSA08J-273YN	RESISTOR		C48	QER50JM-476	E CAPACITOR
	R115	QRSA08J-471YN	RESISTOR		C49	QER51CM-476	E CAPACITOR
	R116	QRSA08J-102	RESISTOR		C50	QCFA1HZ-103	CAPACITOR
	R117	QRSA08J-102	RESISTOR		C51	QFN41HJ-273	M CAPACITOR
	R118	QRSA08J-122YN	RESISTOR		C52	QFN41HJ-103	M CAPACITOR
	R119	QRSA08J-102	RESISTOR		C53	QER51HM-105	E CAPACITOR
	R120	QRSA08J-102	RESISTOR		C54	QCSA1HJ-470	CAPACITOR
	R121	QRSA08J-471YN	RESISTOR		C55	QCFA1HZ-103	CAPACITOR
	R122	QRSA08J-561YN	RESISTOR		C56	QCFA1HZ-103	CAPACITOR
	R123	QRSA08J-122YN	RESISTOR		C57	QCSA1HJ-7R0	CAPACITOR
	R124	QRSA08J-821YN	RESISTOR		C58	QCFA1HZ-103	CAPACITOR
	R125	QRSA08J-102	RESISTOR		C59	QCSA1HJ-101	CAPACITOR
	R126	QRSA08J-122YN	RESISTOR		C60	QCZ0208-104	MC CAP
	R127	QRSA08J-222	RESISTOR		C61	PU60733-500	TRIMMER CAPACITOR
	R128	QRSA08J-681YN	RESISTOR		C62	PU60733-500	TRIMMER CAPACITOR
	R129	QRSA08J-101YN	RESISTOR		C63	PU60733-500	TRIMMER CAPACITOR
	R130	PU57457-682	V RESISTOR, SP EQ		C64	PU60733-500	TRIMMER CAPACITOR
	R131	PU57457-332	V RESISTOR, LP EQ		C101	QCFA1HZ-103	CAPACITOR
	R134	QRSA08J-102	RESISTOR		C102	QCSA1HJ-680	CAPACITOR
	C1	QCFA1HZ-103	CAPACITOR		C110	QER50JM-476	E CAPACITOR
	C2	QCFA1HZ-103	CAPACITOR		C111	QCFA1HZ-103	CAPACITOR
	C3	QCFA1HZ-103	CAPACITOR		C112	QCFA1HZ-103	CAPACITOR
	C4	QCFA1HZ-103	CAPACITOR		C113	QCSA1HJ-100	CAPACITOR
	C5	QCVB1CN-103	CAPACITOR		C114	QCSA1HJ-360	CAPACITOR
	C6	QCFA1HZ-103	CAPACITOR		C115	QCSA1HJ-220	CAPACITOR
	C7	QCFA1HZ-103	CAPACITOR		C117	QCSA1HJ-180	CAPACITOR
	C8	QCFA1HZ-103	CAPACITOR		C118	QCFA1HZ-103	CAPACITOR
	C9	QCSA1HJ-560	CAPACITOR		C119	QCSA1HJ-470	CAPACITOR
	C10	QCSA1HJ-680	CAPACITOR		C121	QCFA1EZ-104	CAPACITOR
	C11	QCSA1HJ-470	CAPACITOR		L4	PU48530-101K	COIL
	C12	QCSA1HJ-470	CAPACITOR		L5	PU48530-101K	COIL
	C13	QCFA1HZ-103	CAPACITOR		L9	PU59152-330J	COIL
	C14	QCFA1HZ-103	CAPACITOR		L10	PU59152-181J	COIL
	C15	QCFA1HZ-103	CAPACITOR		L11	PU59152-4R7K	COIL
	C16	QCFA1HZ-103	CAPACITOR		L12	PU59152-270J	COIL
	C17	QER51HM-105	E CAPACITOR		L13	PU48530-101K	COIL
	C18	QCFA1HZ-103	CAPACITOR		L14	PU48530-101K	COIL
	C19	QER51HM-105	E CAPACITOR		L15	PU59152-120J	COIL
	C20	QCSA1HJ-101	CAPACITOR		L106	PU48530-101K	COIL
	C21	QER51HM-105	E CAPACITOR		L107	PU59152-820J	COIL
	C22	QCFA1HZ-103	CAPACITOR		L108	PU59152-390J	COIL
	C23	QCFA1HZ-103	CAPACITOR		L109	PU59152-220J	COIL
	C24	QER50JM-476	E CAPACITOR		L110	PU59152-220J	COIL
	C25	QCFA1HZ-103	CAPACITOR		L114	PU59152-330J	COIL
	C26	QCFA1HZ-103	CAPACITOR		BKT1	PQ42955	PWB BKT
	C27	QER51HM-105	E CAPACITOR		ETH1	PQ40433-2	EARTH LUG
	C28	QCFA1HZ-103	CAPACITOR		SCW1	DPSP2606Z	SCREW, X2
	C29	QER50JM-476	E CAPACITOR		SCW2	DPSP2606Z	SCREW
	C30	QER51HM-104	E CAPACITOR		SLD2	PU36485	SHIELD PLATE
	C31	QCFA1HZ-103	CAPACITOR		SLD3	PU36486	SHIELD CASE
	C32	QCFA1HZ-103	CAPACITOR		SPC1	WBS2600Z	TOOTH LOCK WASHER
	C33	QCFA1HZ-103	CAPACITOR		SPC2	PU59210-001	W.LOCKING SPACE, X5
	C34	QCSA1HJ-821	CAPACITOR		TP1	PU56008	TEST-PIN, X8
	C35	QRSA08J-0R0	RESISTOR		CN1	PU56258-10	CAP HOUSING
	C37	QCSA1HJ-121	CAPACITOR				
	C38	QCSA1HJ-121	CAPACITOR				
	C39	QCSA1HJ-331	CAPACITOR				

#	REF NO.	PART NO.	PART NAME, DESCRIPTION
CN2	PU58844-3	CAP HOUSING	
CN3	PU58844-3R	CAP HOUSING	
CN4	PU58844-5R	CAP HOUSING	
CN5	PU58844-5Y	CAP HOUSING	
CN6	PU58844-4	CAP HOUSING	
CN7	PU58844-5	CAP HOUSING	

* 16. DECK TERMINAL BOARD ASSY <51> *

PWBA	PB20013D-02	DECK TERMINAL BOARD ASSY
PWBA1	PB20013C1	DECK TERMINAL BOARD ASSY
R1	QRD181J-151	RESISTOR
R3	QRD181J-331	RESISTOR
PS1	PU60271	PHOTO INTERRUPTER
CN1	PEMC0722-017 OR PEMC0753-017	WIRE TRAP WIRE TRAP

* 17. RELAY BOARD ASSY <52> *

PWBA2	PB20013C2-02	RELAY BOARD ASSY
C1	QCC11EJ-104	CAPACITOR
LC1	PU59736-471	N FILTER
LC2	PU59736-471	N FILTER
K1	PU60281-5	FERRITE BEADS
WR1	PW30113-GOABZ62 OR PW30118-GOABZ62	PARALLEL WIRE PARALLEL WIRE

* 18. REC SAFETY BOARD ASSY <53> *

PWBA3	PB20013A3	REC SAFETY BOARD ASSY
S1	PU58644-1-3	REC SAFETY SWITCH

* 19. END SENSOR BOARD ASSY <54> *

PWBA4	PB20013A4	END SENSOR BOARD ASSY
Q1	PN268R-NC	PHOTO TRANSISTOR
HD1	PQ31047-1-4	END SENSOR HOLDER
CN1	PU59945-102	WIRE SOCKET

#	REF NO.	PART NO.	PART NAME, DESCRIPTION

* 20. CASSETTE HOUSING BOARD ASSY <56> *

PWB	PB30043	CASSETTE HOUSING PWB	
Q1	PN268R-NC	PHOTO TRANSISTOR	
R1	QRD162J-471	RESISTOR	
PS1	PU58879	PHOTO INTERRUPTER	
CN1	PU58844-106	CAP HOUSING	

***** * 21. ON SCREEN DATE/BATTERY BOARD(1) ASSY <* *****			
PWBA	PGE20315A-01	ON SCREEN/BATTERY B.ASSY	
BAT1	PGZ00785	BATTERY CASE, X2	
BAT2	PGZ01334	BATTERY CASE	
BAT3	PRD30543	BATTERY CASE	
BAT4	PRD42905	BATTERY SHEET	
PWBA1	PGE20315A1-01	ON SCREEN/BATTERY B.(1) ASSY	
IC1	UPD75108CW-B85	IC	
IC2	IC-PST523H-2	IC	
Q1	2SA933S(RS)	TRANSISTOR	
Q52	DTC144EF	TRANSISTOR	
D1	ISS133	DIODE	
D2	LTZ-MR15	DIODE	
D3	ISS133	DIODE	
D4	ISS133	DIODE	
R1	QRD161J-102	RESISTOR	
R3	QRD161J-272	RESISTOR	
R4	QRD161J-104	RESISTOR	
R5	QRD161J-561	RESISTOR	
R6	QRD161J-103	RESISTOR	
R7	QRD161J-222	RESISTOR	
R8	QRD161J-562	RESISTOR	
R9	QRD161J-222	RESISTOR	
R10	QRD161J-821	RESISTOR	
R11	QRD161J-103	RESISTOR	
R12	QRD161J-102	RESISTOR	
R13	QRD161J-102	RESISTOR	
R14	QRD161J-102	RESISTOR	
R52	QRD161J-273	RESISTOR	
R53	QRD161J-564	RESISTOR	
R54	QRD161J-472	RESISTOR	
R55	QRD161J-103	RESISTOR	
RA1	QRB097J-104	NETWORK RESISTOR	
OR	QRB099J-104	NETWORK RESISTOR	
C1	QER61CM-476	E CAPACITOR	
C2	QCVB1CN-103	CAPACITOR	
C3	QER61CM-106	E CAPACITOR	

#	REF NO.	PART NO.	PART NAME, DESCRIPTION	#	REF NO.	PART NO.	PART NAME, DESCRIPTION
	C4	QER61CM-106	E CAPACITOR		C111	QCXB1CN-152	CAPACITOR
	C5	QER41AM-107	E CAPACITOR		C112	QCSB1HJ-220	CAPACITOR
	C6	PU57672-400	TRIMM.C, TIME DATE POS ADJ		C113	QCVB1CM-103	CAPACITOR
	C7	QER61CM-476	E CAPACITOR		C114	QCVB1CM-103	CAPACITOR
	C8	QCVB1CN-103	CAPACITOR		C115	QFN31HJ-222	M CAPACITOR
	L1	PU59152-101J	COIL		C116	QER61HM-105	E CAPACITOR
	L2	PU59152-100J	COIL		L101	PU58333-180K	COIL
△	CF1	PU59576	RESONATOR		L102	PU59152-100J	COIL
	SCW1	SDSP2606Z	SCREW, X2	△	CF101	PU60086	CERAMIC FILTER
	SCW2	SDSP2604M	SCREW, X2		TP101	PU56008	TEST-PIN
	SKT1	PGZ01001	IC SOCKET, (FOR IC1)		CN101	PGZ01081-09	MICRO HEADER
		PU44398	FUSE SOCKET, X2		CN102	PGZ01081-03	CAP HOUSING
	SPC1	PRD43011	SHEET		CN103	PGZ01081-03	CAP HOUSING
	TP1	PU54983	TEST PIN, X5	*****	*****	*****	*****
	CN1	PU58844-7	CAP HOUSING				
	CN2	PU58844-8Y	CAP HOUSING				
	CN3	PU58844-3R	CAP HOUSING				
*****	*****	*****	*****				
	PWBA2	PGE20315A2-01	ON SCREEN/BATTERY BOARD(2) ASSY	PWBA	PGE20331A-02	REAR BOARD ASSY	
	IC101	MB89010A-108	IC		D201	RD5.1EB	ZENER DIODE
	IC102	BU4013B	IC		D203	RD5.1EB	ZENER DIODE
		OR TC4013BP	IC		R201	QRD167J-750	RESISTOR
	IC103	M52684AP	IC		RA201	QRB087J-103 OR QRB089J-103	RESISTOR ARRAY RESISTOR ARRAY
	Q101	2SA1309R,S	TRANSISTOR		C202	QCF31HP-223	CAPACITOR
	Q102	DTC114EF	TRANSISTOR		C203	QCF31HP-103	CAPACITOR
	R101	QRD161J-472	RESISTOR		S201	PGZ00469-02	SLIDE SWITCH
	R102	QRD161J-102	RESISTOR		S202	QSS1K81-L01	DIP SWITCH
	R103	QRD161J-102	RESISTOR		TB1	PGZ01267-03	TERMINAL BOAD
	R104	QRD161J-102	RESISTOR	△	VA201	PU49624-2	VARISTOR
	R105	QRD161J-102	RESISTOR	△	VA203	PU49624-2	VARISTOR
	R106	QRD161J-472	RESISTOR		CN201	PU59513-4	CAP HOUSING
	R107	QRD161J-222	RESISTOR		CN202	PU59513-4R	CAP HOUSING
	R108	QRD161J-681	RESISTOR		CN203	PU58844-102	CAP HOUSING
	R109	QRD161J-222	RESISTOR		CN204	PU58844-110	CAP HOUSING
	R110	QRD161J-103	RESISTOR		CN205	PU58844-105	CAP HOUSING
	R111	QRD161J-102	RESISTOR	*****	*****	*****	*****
	R112	QRD161J-471	RESISTOR				
	R113	QRD161J-182	RESISTOR				
	R114	QRD161J-154	RESISTOR				
	R115	QRD161J-271	RESISTOR				
	R116	QRD161J-152	RESISTOR				
	R117	QRD161J-103	RESISTOR				
	R118	QRD161J-103	RESISTOR				
	C101	QER61CM-476	E CAPACITOR	PWBA	PGE20314A	DISPLAY BOARD ASSY	
	C102	QCVB1CM-103	CAPACITOR		IC1	MSC7112-01SS	IC
	C103	PU57601-335MC	E CAPACITOR		IC2	M50253P	IC
	C104	QCVB1CM-103	CAPACITOR		Q1	DTC144EF	TRANSISTOR
	C105	QCSB1HJ-150	CAPACITOR		Q2	DTC144EF	TRANSISTOR
	C106	QCSB1HJ-330	CAPACITOR		D1	RD7.5EB2	ZENER DIODE
	C107	QER61HM-335GZ	E CAPACITOR		D2	ISS132	DIODE
	C108	QCBB1HJ-101	CAPACITOR		D3	ISS132	DIODE
	C109	QER61CM-106	E CAPACITOR		D4	SEL1320G	LE DIODE
	C110	QCVB1CM-103	CAPACITOR		D5	SLB-55VR3F	LE DIODE

#	REF NO.	PART NO.	PART NAME, DESCRIPTION	#	REF NO.	PART NO.	PART NAME, DESCRIPTION
	D6	ISS133	DIODE		D9	ISS133	DIODE
	R1	QRD167J-102	RESISTOR		D10	ISS133	DIODE
	R2	QRD167J-102	RESISTOR		D11	ISS133	DIODE
	R3	QRD167J-102	RESISTOR		D12	V03C	DIODE
	R4	QRD167J-273	RESISTOR		D13	ISS133	DIODE
	R5	QRD167J-103	RESISTOR		R1	QRD167J-103	RESISTOR
	R6	QRD167J-221	RESISTOR		R2	QRD167J-104	RESISTOR
	R7	QRD167J-331	RESISTOR		R3	QRD167J-103	RESISTOR
	R8	QRD167J-472	RESISTOR		R4	QRD167J-104	RESISTOR
	R9	QRD167J-472	RESISTOR		R5	QRD167J-333	RESISTOR
	R10	QRD167J-472	RESISTOR		R6	QRD167J-333	RESISTOR
	R11	QRD167J-223	RESISTOR		R7	QVZ3507-104	V RESISTOR
	R12	QRD167J-472	RESISTOR		R8	QRD167J-224	RESISTOR
	RA1	QRB037J-222	RESISTOR ARRAY		R9	QRD167J-102	RESISTOR
	C1	QCB81HJ-101	CAPACITOR		R10	QRD167J-473	RESISTOR
	C2	QER61HM-104	E CAPACITOR		R11	QRD167J-104	RESISTOR
	C3	QCF11HP-223	CAPACITOR		R12	QRD167J-563	RESISTOR
	C4	QER60JM-336	E CAPACITOR		C1	QER41CM-476	E CAPACITOR
	C5	QCS31HJ-560	CAPACITOR		C2	QFN41HJ-102	M CAPACITOR
	C6	QCF11HP-473	CAPACITOR		C3	QFN41HJ-102	M CAPACITOR
	C7	QCS31HJ-560	CAPACITOR		C4	QER41CM-476	E CAPACITOR
	C8	QCS31HJ-560	CAPACITOR		C5	QFN41HK-103	M CAPACITOR
	C9	QCS31HJ-680	CAPACITOR		C6	QFN41HK-103	M CAPACITOR
	C10	QCS31HJ-680	CAPACITOR		C7	QFN41HK-103	M CAPACITOR
	FDP1	PGZ01390	FLUORESCENT DISPLAY PANEL		C8	QER41EM-335	E CAPACITOR
	TH1	PU52108-100K	POSITIVE THERMISTOR		C9	QCS11HJ-221	CAPACITOR
	CL1	PU59311-2	WIRE CLAMP		C10	QER41HM-474	E CAPACITOR
	HD1	PRD41673	LED HOLDER		C11	QCC11EJ-223	CAPACITOR
	HD2	PQ40113-1-1	LED HOLDER		L1	PU48530-181J	COIL
	HD3	PQ31309	FDP HOLDER(L)		CN1	PU58844-109	CAP HOUSING
	HD4	PQ31310	FDP HOLDER(R)		CN2	PU58844-102Y	CAP HOUSING
	SPC1	PRD30030-33	PAD				*****
	SPC2	PRD42546	DISPLAY SHEET				*****
	SPC3	PRD30030-15	PAD				*****
	WR1	PGW0202-080060	PARALLEL WIRE				*****
	CN1	PGZ01070-06	CAP HOUSING		PWBA	PRK20051A	TIMER BOARD ASSY
	CN2	PU58844-103	CAP HOUSING			IC1	UPD75216ACW-B05 IC
	CN3	PU58844-102	CAP HOUSING			IC2	M5278L56 IC
	CN4	PU59513-12	CAP HOUSING			IC3	IC-PST523H-2 IC
	CN5	PU58844-105	CAP HOUSING			IC4	IC-PST523H-2 IC
						Q1	2SC3311A(RS) TRANSISTOR
						D1	RD9.1ES-T1B2 ZENER DIODE
						D2	ISS133 DIODE
						D3	ISS133 DIODE
						D4	RD8.2ES-T1B2 ZENER DIODE
	PWBA	PGE20264B	CLEANER BOARD ASSY			D5	ISS133 DIODE
	IC1	TC4011UBP	IC			D6	ISS133 DIODE
	IC2	TC4040BP	IC			D7	RD7.5ES-T1B1 ZENER DIODE
	IC3	TC4069UBP	IC			D8	ISS133 DIODE
	IC4	BA222	IC			D9	LTZ-MR15 DIODE
	Q1	2SD973R	TRANSISTOR			D10	ISS133 DIODE
	D1	ISS133	DIODE			D11	ISS133 DIODE
	D2	ISS133	DIODE			D12	ISS133 DIODE
	D4	ISS133	DIODE			D13	ISS133 DIODE
	D7	ISS133	DIODE			D14	ISS133 DIODE
	D8	ISS133	DIODE			R1	QRD161J-472 RESISTOR
						R2	QRD161J-682 RESISTOR

#	REF NO.	PART NO.	PART NAME, DESCRIPTION	#	REF NO.	PART NO.	PART NAME, DESCRIPTION					
	R3	QRD161J-104	RESISTOR		C7	QCF31HP-103	CAPACITOR					
	R4	QRD161J-471	RESISTOR		C9	QETC1HM-225	E CAPACITOR					
	R5	QRD161J-102	RESISTOR		C10	QEK61HM-336	E CAPACITOR					
	R6	QRD161J-333	RESISTOR		C11	QCT30CH-120	CAPACITOR					
	R7	QRD161J-102	RESISTOR		C12	QAT3661-200	TRIMMER CAPACITOR, CLOCK ADJ					
	R8	QRD161J-224	RESISTOR		C13	QCS31HJ-330	CAPACITOR					
	R9	QRD161J-473	RESISTOR		C14	QCS31HJ-330	CAPACITOR					
	R10	QRD161J-102	RESISTOR		C15	QETC1CM-476	E CAPACITOR					
	R11	QRD161J-123	RESISTOR		C16	QCF31HP-473	CAPACITOR					
	R12	QRD161J-223	RESISTOR		C17	QETA1AM-577	E CAPACITOR					
	R13	QRD161J-0R0	RESISTOR		C18	QETC1HM-105	E CAPACITOR					
	R14	QRD161J-223	RESISTOR		▲ X1	PU60226-4	CRYSTAL RESONATOR					
	R16	QRD161J-472	RESISTOR		▲ X2	PU58394	CRYSTAL RESONATOR					
	R17	QRD161J-472	RESISTOR		▲ RY1	PU55260	RELAY					
	R18	QRD161J-472	RESISTOR		▲ TH1	PU52108-100K	POSITIVE THERMISTOR					
	R19	QRD161J-472	RESISTOR		▲ TH2	PU52108-100K	POSITIVE THERMISTOR					
	R20	QRD161J-103	RESISTOR		SKT1	PGZ01001	IC SOCKET,(FOR IC1)					
	R21	QRD161J-103	RESISTOR		SPC1	PU59210-001	W.LOCKING SPACE, X2					
	R22	QRD161J-103	RESISTOR		TP1	PU54983	TEST PIN, X5					
	R23	QRD161J-103	RESISTOR		CN1	PGZ01298-16	CAP HOUSING					
	R24	QRD161J-103	RESISTOR		CN2	PU58844-8Y	CAP HOUSING					
	R25	QRD161J-103	RESISTOR		CN3	PGZ01298-06	CAP HOUSING					
	R26	QRD161J-103	RESISTOR		CN4	PU58844-7	CAP HOUSING					
	R27	QRD161J-103	RESISTOR		CN5	PU58844-9R	CAP HOUSING					
	R28	QRD161J-103	RESISTOR		*****							
	R29	QRD161J-103	RESISTOR		*****							
	R30	QRD161J-103	RESISTOR		*****							
	R31	QRD161J-103	RESISTOR		*****							
	R32	QRD161J-102	RESISTOR		*****							
	R33	QRD161J-104	RESISTOR		*****							
	R34	QRD161J-104	RESISTOR		*****							
	R35	QRD161J-102	RESISTOR		*****							
	R36	QRD161J-102	RESISTOR		*****							
	R37	QRD161J-103	RESISTOR		*****							
	R38	QRD161J-103	RESISTOR		*****							
	R39	QRD161J-103	RESISTOR		*****							
	R40	QRD161J-103	RESISTOR		*****							
	R41	QRD161J-334	RESISTOR		PWBA	PGE10139A	OPERATION BOARD ASSY					
	R42	QRD161J-102	RESISTOR		PWBA1	PGE10139A1	OPERATION 1 BOARD ASSY					
	R43	QRD161J-103	RESISTOR		IC1	LA7225	IC					
	R44	QRD161J-103	RESISTOR		Q1	2SA1309R,S	TRANSISTOR					
	R45	QRD161J-102	RESISTOR		D1	SLR-55VC3F	LE DIODE					
	R46	QRD161J-104	RESISTOR		R1	QRD161J-223	RESISTOR					
	R47	QRD161J-472	RESISTOR		R2	QRD161J-104	RESISTOR					
	R48	QRD161J-472	RESISTOR		R3	QRD161J-120	RESISTOR					
	R49	QRD161J-472	RESISTOR		R4	QRD161J-152	RESISTOR					
	R50	QRD161J-472	RESISTOR		R6	QRD161J-102	RESISTOR					
	R51	QRD161J-472	RESISTOR		R7	QRD161J-104	RESISTOR					
	R52	QRD161J-223	RESISTOR		R8	QRD161J-102	RESISTOR					
	R53	QRD161J-223	RESISTOR		R9	QRD161J-222	RESISTOR					
	R54	QRD161J-104	RESISTOR		R10	QRD161J-223	RESISTOR					
	R55	QRD161J-103	RESISTOR		R11	QRD161J-331	RESISTOR					
	R56	QRD161J-104	RESISTOR		R12	QRD161J-222	RESISTOR					
	R57	QRD161J-104	RESISTOR		R13	QRD161J-222	RESISTOR					
	R59	QRD161J-103	RESISTOR		R14	QRD161J-332	RESISTOR					
	R62	QRD161J-0R0	RESISTOR		R15	QRD161J-472	RESISTOR					
	RA1	QRB067J-104	NETWORK RESISTOR		R16	QRD161J-103	RESISTOR					
OR	QRB069J-104	NETWORK RESISTOR			R17	QRD161J-222	RESISTOR					
RA2	QRB077J-104	NETWORK RESISTOR			R18	QRD161J-222	RESISTOR					
OR	QRB079J-104	NETWORK RESISTOR			R19	QRD161J-183	RESISTOR					
	C1	QETC1CM-336	E CAPACITOR		R20	QRD161J-823	RESISTOR					
	C2	QETC1CM-336	E CAPACITOR		R21	QRD161J-104	RESISTOR					
	C3	QEA40HZ-104	E CAPACITOR		R22	QRD161J-103	RESISTOR					
	C4	QCF31HP-102	CAPACITOR									
	C5	QETC1CM-106	E CAPACITOR									
	C6	QCF31HP-103	CAPACITOR									

#	REF NO.	PART NO.	PART NAME, DESCRIPTION	#	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R23	QV23507-474	V RESISTOR,V.LOCK		S105	PU58486-1-1	SLIDE SWITCH
	R24	PGZ01302	V RESISTOR,T.D BRIGHT		S106	PU58488-1-1	SLIDE SWITCH
	R25	PGZ00688	V RESISTOR,P.SHARP		S107	PU57551	TACT SWITCH
	R26	QRD161J-101	RESISTOR		S108	PU57551	TACT SWITCH
	R27	QRD161J-101	RESISTOR		S111	PU57551	TACT SWITCH
C1	QER61EM-475	E CAPACITOR		S112	PU57551	TACT SWITCH	
C2	QFJ41HJ-273	M CAPACITOR		S113	PU57551	TACT SWITCH	
C3	QER61HM-225	E CAPACITOR		S115	PU57551	TACT SWITCH	
C4	QER61AM-476	E CAPACITOR		S116	PU57551	TACT SWITCH	
C5	QER60JM-476	E CAPACITOR		S117	PU57551	TACT SWITCH	
C6	QCB81HJ-471	CAPACITOR		S118	PU57551	TACT SWITCH	
L1	PU59060	TRAP COIL		S121	PU57551	TACT SWITCH	
S1	PGZ01303	KEY LOCK SWITCH		S122	PU57551	TACT SWITCH	
S2	PU57551	TACT SWITCH		S123	PU57551	TACT SWITCH	
S3	PU57551	TACT SWITCH		S124	PU57551	TACT SWITCH	
S4	PU57551	TACT SWITCH		S125	PU57551	TACT SWITCH	
S5	PU57551	TACT SWITCH		S126	PU57551	TACT SWITCH	
S6	PU57551	TACT SWITCH		CL1	PU59311-2	WIRE CLAMP	
S7	PU57551	TACT SWITCH		COL1	PRD30026-35	COLLAR	
S8	PGZ01092	PUSH SWITCH		HD1	PGZ01031-02	P C SUPPORT, X3	
S9	PU57551	TACT SWITCH		SCW1	SPSP3012Z	SCREW	
S10	PU57551	TACT SWITCH		SCW2	SBST3006Z	SCREW, X3	
S11	PU57551	TACT SWITCH		SPC1	PU50634-2	LED SPACER, X7	
CL1	PU59311-2	WIRE CLAMP, X3			PQM30017-4	SLIT WASHER	
JA1	PGZ00409	PIN JACK		WRI	PGW0202-080160	PARALLEL WIRE	
SPC1	PU50634-2	LED SPACER		J101	QWE251-16A2A2	WIRE	
CN1	PU58844-6	CAP HOUSING		CN101	PU58844-10	CAP HOUSING	
CN2	PU58844-3	CAP HOUSING		CN102	PU58844-12	CAP HOUSING	
CN3	PU58844-2	CAP HOUSING		CN103	PU58844-6	CAP HOUSING	
CN4	PU58844-5	CAP HOUSING		CN104	PU58844-3	CAP HOUSING	
CN5	PU58844-10	CAP HOUSING		CN105	PGZ01070-16	CAP HOUSING	

***** * 28. OPERATION 2 BOARD ASSY <93> * *****							
PWBA2	PGE10139A2	OPERATION 2 BOARD ASSY					
Q101	DTA114EF	TRANSISTOR					
D101	SLR-55VC3F	LE DIODE					
D102	SLR-55VC3F	LE DIODE					
D103	SLR-55VC3F	LE DIODE					
D104	SLR-55VC3F	LE DIODE					
D105	SLR-55VC3F	LE DIODE					
D106	SLR-55VC3F	LE DIODE					
D107	SLR-55VC3F	LE DIODE					
D108	ISS133	DIODE					
R101	QRD161J-331	RESISTOR					
R102	QRD161J-331	RESISTOR					
R103	QRD161J-331	RESISTOR					
R104	QRD161J-331	RESISTOR					
R105	QRD161J-331	RESISTOR					
R106	QRD161J-331	RESISTOR					
R107	QRD161J-331	RESISTOR					
R108	QRD161J-102	RESISTOR					
S101	PU58486-1-1	SLIDE SWITCH					
S102	PU58486-1-1	SLIDE SWITCH					
S103	PU58486-1-1	SLIDE SWITCH					
S104	PU58486-1-1	SLIDE SWITCH					